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WHY DO LUMBER MEN NOT APPLY FORESTRY?

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IT is precisely thirty years, a generation, since the forestry movement was publicly started in the United States by the Forestry Congress meeting in Cincinnati.

What success has it had in persuading timberland owners to apply forestry methods to their holdings? Outside the Federal Government, which has actually and on a large scale begun to introduce forest management on its timberlands, outside of a few half-hearted and small beginnings of some of the States to bring their few acres of timberland under some systematic treatment, how many private owners and on how many acres have they made even such beginnings in changing their attitude towards their timber properties and cut-over lands, such as forestry implies?

When it is realized that the private ownership represents about three-quarters of the total timber supply and forest area of the country, the importance of the attitude of the owners becomes apparent.

Whatever some hopeful enthusiasts may think of the situation, to the cold-blooded reasoner from facts, there is as yet little cause for congratulation visible. There is, to be sure, little information published on the subject, but we may be quite sure that everything worth noting is on record regarding private endeavor in introducing forest management, and in what is on record the most comprehensive construction has been given as to what includes forest management.

The results of an inquiry reported in the second volume of the Report of the Commission of Conservation show that out of around 600 firms, representing not as much as 3% of the total privately owned acreage, hardly one-fifth in numbers uses some conservative methods, one-quarter is held for a future crop, and only a little over one-third in acreage reports even measures taken for protection against fires! In another inquiry, the acreage reported protected against fire rises to as much as 50 per cent of the reported ownership. If these reported conditions were at all representative, they would show, that still most owners of timberland do not even take precaution to protect their property against fire. In this respect, however, great strides for the better have been made lately, and, if a new inquiry should develop that really effective measures are in operation on half the acreage of *cut-over lands*—the most important part for the future—our hopes for the eventual application of forestry would rise one hundred per cent.

This leads us to the question: is protection against fire forestry? Is the surveying and mapping, and more careful estimating and locating of timber, and systematic arrangement of logging operations, forestry? Is even, holding for a future crop forestry? Indeed, what is forestry?

It seems rather late in the day to raise this question, and yet even professional foresters have hazy notions as to how to answer the question; the incidents of forest management appear to them principal issues! Of course,

protection against fire is necessary in order to carry on forest management. So in any other business protection of the property is a first essential; it is merely a general, not a specific, measure, belonging to any one business.

Of course, it is wisdom to base logging operations on systematic plans based on accurate information, as in any other business. This also is merely a general prerequisite of scientific, i. e., rational management not specific to forestry except in the method of ascertainment. It is, to be sure, also an incident to forest management, but not an essential. Lumbermen have done similar things without any thought or knowledge of forestry, in a cruder manner, and may now find that the foresters do it better and cheaper than the old cruisers, hence may be inclined to employ foresters.

Lumbermen that will make plans to protect their property will map and plan the operations on their holdings systematically, they will adopt measures to reduce waste in the logging, to utilize more closely, etc., merely because they find that it pays *in the present*. The cutting to a diameter limit, which is advocated as a forestry measure, is also commendable to the lumberman only when he has figured out that his present business of exploiting the forest pays better if he delays for some years the cutting of smaller sizes until they have increased in diameter and value; it is a short time financial calculation that induces him which has not necessarily anything to do with forestry. Even the "holding for future crop" will, we suspect, be found in most cases to reduce itself to the same position, namely, a waiting for increase in size and value of the present immature crop which Nature had provided.

Finally, we must declare, that leaving mature timber standing is no more forestry than storing and keeping locked up goods in trade!

Some of my professional friends will take issue with these declarations, since all these measures are incidents or may be turned into useful adjuncts to forestry management. But I take the position that from the broad standpoint of political economy the idea of forestry involves an attitude of the owner towards his property, which either makes these measures a part of a forestry program or excludes them from such designation.

The forest can be looked upon either as a mine, the stored material of preceding ages, which the lumberman exploits, or else it may be conceived as a crop, which the forester harvests and reproduces. Reproduction is the keynote of forestry; it denotes the difference between the exploiter, the converter of material into serviceable form, and the forester, the crop *producer*.

How many of the timberland owners, even those who adopt the measures enumerated above for improving their business conduct, look at their property as a means for continuous crop production, for sustained yield? I do not mean the strict economic sustained yield, but the silviculturally sustained yield, i. e., the deliberate, intentional devotion of the soil to the production of wood crops. I venture to assert that there are as yet not as many as can be counted on the fingers of two hands who would affirm that they had deliberately started into the business of wood production—which is forestry!

Even those, who have started planting their waste places—and we are glad to see their number growing rapidly—will be found often dubious as to their purpose.

At any rate, we come back to the original statement that attempts on the part of corporations and individuals to start in the forestry business are so sporadic and few that it is worth while to inquire for the cause of the failure to follow our advice.

There is one simple answer, the one condition by which forest cropping differs from all other business: the *time element* and the many uncertainties which that involves!

It takes 60 to 100 years and more to grow saw timber from the seed—as a rule, varying with locality and species, 1 inch in 5 to 10 years in diameter may be secured on the average; the sower rarely is the reaper. During all this time there is the fire risk, and the risk

from wind and insects; there is the capital invested without a chance of changing the investment. Will, so long hence, wood, or this particular kind of wood be wanted in the market? Will substitutes have replaced wood? What will be the wood prices? Will our present outlay be returned to us with proper interest earnings?

We may point to Europe and show that forest property after all is on the whole not necessarily so hazardous as with us at present—with us it is still more hazardous than any other and for reasons must remain so for some time; that, in spite of substitutes, wood consumption has continuously increased; that wood prices have continuously increased; that excellent returns have come from persistent forest management.

All this occurred under other conditions of civilization, and in the past, who can assure us of the future? Forestry deals in futures, and if it is hazardous to deal in futures in Wall Street, so the forester owner thinks it is wiser to secure the present dollar instead of waiting for the possible two. The disposition of all our people is to live for the present, and the timberland owner is naturally not an exception.

This sounds altogether pessimistic. It is not intended to be so, but is to bring home the fact that forestry as defined above is a business *sui generis*, that it can be successfully carried on only under special conditions, and that private, present interest is not likely to enter it with ardor and persistency. One of the important conditions for its successful conduct—we leave out of consideration the farmer's wood lot—is *size*.

Some twenty years ago I was asked whether I thought that forestry could be profitably practised in the United States at that time. I did not hesitate to state the conditions under which, in my opinion, it could be practised. Give me two million acres of southern pine and three million dollars of capital, and it would not be difficult to demonstrate that a real forestry practice, i. e., deliberate, systematic reproduction of the cut areas will pay in the long run.

Altogether, forestry is a business for the long run, hence persistent corporations, municipalities, States who live into the future are the proper persons to engage in it. Until we wake up to this realization much energy to induce small forest owners to go into the business will be wasted.

HIS WISDOM.

He didn't know how to handle a rod, nor how to attach a fly;
He didn't know how to catch a trout in the brook that went flowing by;
When he wounded a buck he didn't know whether to run or stay and fight,
And he didn't know how to make a temporary camp at night.

He didn't know how to tell the time by looking at the sun;
He didn't know how to take the shells out of a loaded gun;
He got so turned around he didn't know what course to take,
And he didn't know what to do when he was bitten by a snake.

He didn't know what it was once when he handled poison oak;
He didn't know how to build a fire, nor how to conceal its smoke;
But he was wise—of that fact there can't be the slightest doubt.
When he broke camp he knew enough to put the fire out!

Pasadena, Cal. HOWARD C. KEGLEY.

NEW YORK'S LUMBER INDUSTRY.

New York is credited with having 2,263 *lumber and timber plants, employing an average of* 27,471 *people. The value of the product for the year was placed at* $72,530,000. *There were* 674 *independent planing mills,* 1,389 *lumber mills and* 200 *packing box factories.*

REDWOOD LOGGING. FELLERS MAKING THE UNDERCUT. AFTER THIS HAS BEEN DONE AND THE BARK CUT AWAY A SAW IS USED.

LOGGING ENGINEERING

By Geo. M. Cornwall,

Editor The Timberman, Portland, Oregon

THE need creates the man. The development of the lumber business of the States of California, Oregon, Washington, Idaho, Montana and the Province of British Columbia, has necessitated a type of rugged woodsmen for the removal of the timber from the hills and valleys to the mill pond at a minimum expense. Nature grew lavishly a timber crop in the great West. Here are approximately the figures which denote Nature's generous gift:

British Columbia	300,000,000,000 to 400,000,000,000 ft.
Washington	391,000,000,000 ft.
Montana	65,000,000,000 ft.
Oregon	545,000,000,000 ft.
Idaho	129,100,000,000 ft.
California	381,000,000,000 ft.
Total	1,811,100,000,000 ft.

These figures indicate that the lumber business of the Pacific Coast States will endure for a long time, the present output being in the neighborhood of about eight and one-half billion feet annually.

The timber of the West is found for the most part in comparatively inaccessible rugged mountain ranges, thus involving difficult engineering problems. In the early stages of the industry when the timber lined the banks of the numerous water courses, logging was rendered a comparatively simple and cheap operation. But this condition has passed forever.

The enormous size of the timber lying directly along the Pacific Coast, including the towering redwoods running up to 300 feet without a limb, and a diameter of 18 feet and over; the Douglas fir (Oregon pine), Menzies' tideland spruce, cedar and hemlock of the Coast regions of California, Oregon and Washington; and the pine family to be found east of the Cascades and Sierra Nevadas, in Northern California, Central and Eastern Oregon, Eastern Washington, Idaho and Montana, and the interior of British Columbia, present topographical features that require a bold, daring, aggressive brain to successfully convert Nature's forest cover to the uses of mankind.

The primitive picturesque ox team has given way to the steam road. There are approximately 450 logging roads in the West, with an aggregate mileage of about 3500 miles. The number is constantly increasing. These roads cost with equipment, from $10,000 to $15,000 per mile, thus indicating the enormous investment in logging railroad equipment, and the necessities for the future. The cost of building these roads has a most direct bearing on the profit of the operation. Here is where the practical logging engineer is invaluable. His experience enables him to gauge with certainty the factor of safety required, yet keeping the initial cost down to a minimum. The railroad engineer generally fails when assigned to this task, as experience has abundantly borne out. He was trained in a different school. His factor of safety would spell financial ruin to many an operation. He forgets to take into account the temporary character of the time he is building; for, outside of the main lines, the roads are temporary, being moved from time to time as occasion requires.

These natural conditions have resulted in the creation of a type of logging engineering unknown anywhere else in the world. There are no parallels. The systems have evolved through sheer necessity. Brawn has

ONE METHOD OF SKIDDING LOGS IN WINTER WHICH HAS BEEN IMPROVED BY THE USE OF MACHINERY.

OXEN USED IN SKIDDING RED FIR IN A WASHINGTON FOREST BY THE OLD-FASHIONED METHOD.

HANDLING LOGS WITH AN OVERHEAD CABLEWAY.

SUGAR AND WHITE PINE TIMBER.

been forced to yield to brain. Not only has the Pacific Coast developed a logging system indigenous to itself, with the application of steam, but it has gone a step further and has begun to employ the white coal of commerce—electricity—in its operations. An elimination of the fire hazard; a reduction in fuel costs, and a surcease from engine water troubles are some of the advantages to be gained through the substitution of electricity for steam.

With the modernizing of equipment comes the vital need for a more technical knowledge on the part of the men. It was considered quite a step from an ox team to a logging locomotive (yet a knowledge of steam was not uncommon); it was a greater step to the utilization of an electric motor in log haulage.

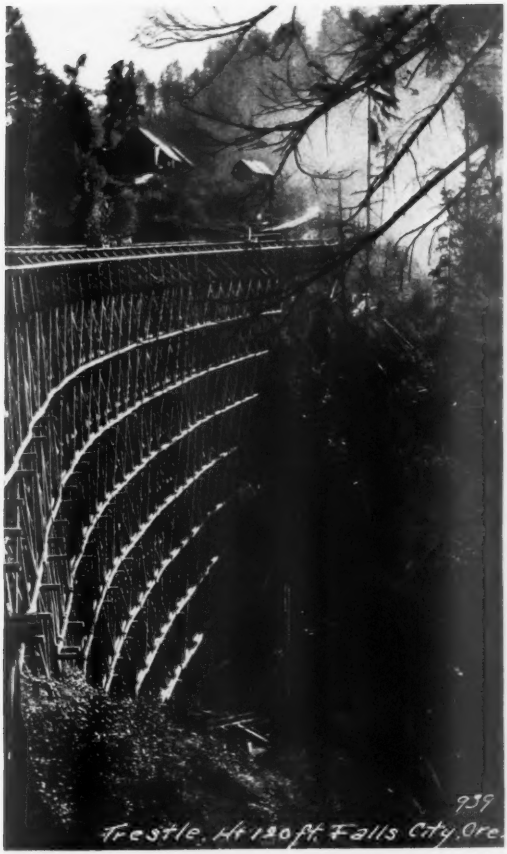
Compressed air and hydraulic engines to lower logs down the steep mountain sides, for distances up to 3500 feet and over, have come into use. Here again the broader knowledge of mechanical engineering in its varied phases, at once becomes a necessity. As an instance in the use of a steam lowering rig whereby logs are lowered 8600 feet on a grade approximately 77 per cent, at the plant of the Yosemite Lumber Company, Merced, California, gives a vivid and concrete idea of some of the difficulties which must be overcome in successfully handling coast logging operations.

A knowledge of civil engineering that makes possible an accurate topographical survey by which the proper location of the roads is determined before commencing operations, involves more than a rudimentary knowledge of surveying. We have now reached a stage where relief maps in plaster of Paris, showing the topography of the country, are now employed in definitely determining the laying out of the operation.

This knowledge of mechanical and civil engineering must necessarily be combined in one individual before he can successfully lay claim to the title of a logging engineer.

With the broadening of knowledge incidental to the modern complicated logging operation has been brought

LOG SUSPENDED EN ROUTE TO THE LANDING.



LUMBER FLUME SUPPORTED BY A TRESTLE 120 FEET HIGH, FALLS CITY, ORE.

forcibly to the front the necessity for a greater and more intelligent care for the men who bear the burden and heat of the day. It is claimed that statistics show that we are only securing about 70 per cent results in our mills and factories, due almost entirely to a lack of physical efficiency. Here is a demand for a knowledge of the underlying principles producing efficiency. If better food, better housing, and adequate bathing facilities are the prerequisites—and they are—why should not a portion of the time spent in executive effort to increase the efficiency of the machinery be spent to increase the efficiency of the men?

Now, how shall we make it possible to provide this necessarily composite knowledge for the logging engineer? Taking the agricultural college as a basis, we find that the course of study was literally made by the farmers; the result has been practical education. The graduates make better farmers than their fathers.

Adopting the same line of reasoning, the lumbermen should draft the courses of study in our colleges and universities where logging engineering is taught.

FALLING MENZIES TIDE LAND SPRUCE.

The course would embrace three branches: First, a knowledge of practical logging, by a preceptor who could hang an ax and fall a tree accurately, yet might not be able to conjugate the verb "amo" to save his life, nor be very proficient in the modern languages.

A practical cruiser or estimator of timber is essential. A knowledge of the amount and character of timber is the basis of operations. The third instructor should be a skilled civil and mechanical engineer, with technical and practical knowledge in equal ratio.

The course of study should involve at least six months in each year in the woods, carrying forward practical logging operations under the guidance of the preceptors. In the winter time, courses in civil and mechanical engineering would be pursued. Each man should attain proficiency in ordinary machine shop practice, coupled with a knowledge of blacksmithing.

On the Pacific Coast at the University of Washington, a practical forestry course has been pursued for several years. The Oregon Agricultural College, and the universities of Idaho and Montana have also provided such courses. In California and British Columbia plans are being formulated for the establishment of logging engineering courses.

FIVE YOKE OX TEAM, OVER 12,000 POUNDS OF BEEF, USED IN HAULING LOGS.

There is a broad and growing field for the logging engineer in the West. Every other large industry can point to its leaders: In electricity, Edison; in canal building, Goethals; in railroad building, Hill. Why not in the great lumber business which ranks among the first of the world's mighty industries?

OUR TIMBER EXPORTS

OFFICIAL statistics of exports of forest products from United States ports during the year ending June 30, 1912, show an increase in value of over $4,000,000. The total value for the year under review amounts to $96,782,186, as compared with $92,225,951 for the preceding year. The increase is due to expansion of trade in boards, deals, planks, joists, and scantling which account for more than half the total export; the figures are 2,340,909,000 ft. for 1912, against 2,060,965,000 ft. for the preceding year. The advantage thus gained not only makes up for the decrease in the export figures for timber but shows a substantial increase on the combined figures. Timber, hewn and sawn, has fallen from 531,634,000 ft. exported in 1910-11 to 438,021,000 ft. for last year. The loss is not attributable to any marked individual reduction, but is spread over all the consuming markets. In lumber the figures for Canada show the large increase of 49,736,000 ft. over the 403,285,000 ft. of the preceding year; South America took the enormous addition of 139,683,000 ft. over 1911; British Oceana 31,937,000 ft.; Netherlands 20,728,000 ft.; United Kingdom 10,104,000 ft. (from 216,433,000 ft. to 226,537,000 ft.). On the other hand shipments to China show a falling off of 37,945,000 ft.; Africa a loss of 10,001,000 ft.; Cuba 8,925,000 ft.; Italy 5,818,000 ft.; Belgium 4,466,000 ft.; France 3,758,000 ft.; Germany 2,983,000 ft.

BOY SCOUTS TO PLANT TREES

J. H. McGILLIVRAY, Deputy Forest Warden of Michigan, under the direction of Major William R. Oates, who organized the Michigan Forest Scouts, including the Boy Scouts of America, has worked out another plan for showing the boy scouts how to be of help to the nation. McGillivray is planning to have 5,000 boys plant pine seedlings next year. The planting will be done on the land from which trees have just been cut down. The seedlings are secured from the Agricultural College plantation, and the railroads deliver them to the boy scouts free of charge. "When a scout or a company of scouts," writes McGillivray, "makes a showing in planting the seedlings we put an honor medal on each scout for service.

"Permit me to suggest that it would be a splendid thing if you could work your scouts with the State Forestry Warden of the forest districts in fire protection and reforestation. Here in Michigan, for the present at least, we must maintain the integrity of our State organization, but there is no reason why you could not line up all the other States in this service."

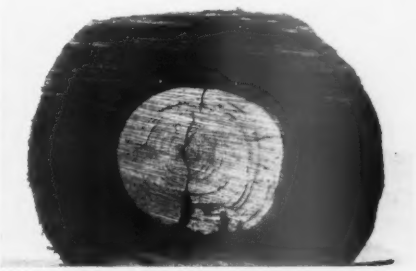
WOOD PRESERVATION AS A FACTOR IN FOREST CONSERVATION

By E. A. Sterling
President, American Wood Preservers' Association

THE preservative treatment of timber against decay has developed rapidly into a very important industry, the broad significance of which is not fully appreciated. The industry has assumed large proportions primarily because of its commercial value; but, in addition, it has a very broad bearing on questions of forest conservation. It helps all wood consumers directly by insuring longer life of material and less frequent renewals; while indirectly it is of value to every citizen because it is a factor in keeping down lumber prices and in conserving our forest resources. To the timberland owners, from lumber magnate to farmer, it means a new and better market for wood material.

The forest propaganda movement of the past twenty years has emphasized the need for fire protection, more equitable forest taxation, closer utilization, and the production of successive forest crops on land unsuited for agriculture. In other words, it is urged that we perpetuate our forest resources by protection and wiser use, so that they will serve our needs. The rapidly increasing consumption of timber—the amount used per capita being about seven times that in Europe—makes the task of providing definitely for our growing requirements almost a hopeless one. Without a material decrease in consumption, the spectre of a future timber famine, which has been marched out at opportune times to arouse latent public sentiment and hasten forest legislation, may actually materialize to the extent of high prices and a distinct scarcity of certain grades or species of timber. High grade white pine, for example, already commands famine prices, and white oak is rapidly approaching the same condition. An actual timber famine is not likely to come in the lifetime of men now living; yet it is quite probable that a crisis will be reached which will affect national prosperity to such an extent as to force a solution of our timber supply problem.

Wood preservation at present is the strongest factor in the reduction of our annual timber bill, which, for lumber and wood in all forms, reaches an enormous total equivalent to at least one hundred billion board feet, worth over



CREOSOTED BEECH CROSS-TIE SHOWING IMPERVIOUS "RED HEART."

one and one-quarter billion dollars at point of manufacture. Nearly half of this is manufactured lumber produced in mills sawing more than 50,000 feet annually. Preservative treatment not only reduces this drain on the forests by increasing the life of timber and making one stick do the work of two or three, but it permits the use of many inferior woods which would be useless without treatment. For the eastern railroads it has kept the source of cross-tie supply nearer home through the use of non-durable woods, such as beech, maple, sap pine, etc., instead of the more expensive white oak and longleaf pine, which have to be shipped long distances.

GENERAL VIEW OF THE PENNSYLVANIA R. R. WOOD PRESERVING PLANT AT PHILADELPHIA, PA.

A CHARGE OF TIES READY TO BE PUT IN THE TREATING CYLINDER. SEVEN OF THE CARS MAKING UP THE CHARGE ARE OUT OF SIGHT IN THE CYLINDER.

In Forest Service Bulletin No. 78 it is stated that "Nearly ten billion feet board measure of structural timber are destroyed each year in the United States. * * * If all the timber were treated which it is practicable to treat, and which could be treated at a profit, nearly six billion feet board measure, or over sixty per cent, could be saved. This saving would represent the annual growth on twenty million acres of well-stocked timber land." In cross-ties alone, the Government estimates that proper preservative treatment would reduce the annual cut to the extent of nearly 60,000,000 ties per year, which is the equivalent of two billion board feet.

The first wood-preserving plant in this country of which there is record was built at Lowell, Mass., in 1848; while the first railroad plant was erected by the Louisville & Nashville Railroad at West Pascagoula, Miss., in 1876. Between these dates and the late 80's there was little development. In 1900 there were only eleven plants in operation, but by the end of 1911 the number had grown to one hundred and one. Of these twenty-four are owned and operated by railroad companies, while the remainder do a general commercial business in the treatment of a large variety of timbers.

The capital invested in these plants is certainly not less than $10,000,000, while the value of the wood material carried in stock for seasoning would run into many more millions of dollars. The initial cost of the plants, however, is comparatively low, considering the enormous volume of material handled and its cost value when treated. A $100,000 plant, for example, will treat each year material worth from one-half to three-quarter million dollars. On the basis of the output of treated timber in 1910, which are the latest figures available, the value of the cross-ties, lumber, poles, and other timbers which received treatment approximated $35,000,000.

Great as has been the progress in preservative treatment, a large percentage of the timber is still used in its natural state. The industry has been built up largely on railroad cross-ties; yet, out of the 148,000,000 used in 1910, only 30,000,000, or about 21 per cent, received preservative treatment. This, however, is an increase of 275 per cent over the number treated in 1905. During the same year 133,000,000 board feet of lumber and timber were treated, which represents less than one-third of one per cent of the total consumption. The total output of all kinds of treated material in 1911 amounted to slightly over 110,372,000 cubic feet, which is over 500 per cent more than was treated in 1904.

It is very difficult to appreciate exactly what cross-ties and lumber, when stated in units of millions, mean in terms of volume. Some idea may be gained if we consider that the 30,000,000 ties treated in 1910 would, if piled 20 ties high, according to the usual arrangement in a treating plant yard, cover an area of over 600 acres, or practically a square mile. If laid one deep side by side, these same ties would cover 10,000 acres with a solid wooden floor the full thickness of the ties.

It certainly must pay to inject timber with preservatives, or the railroads and other commercial concerns would not undertake it. The theory, which is very old, has become an established practice of unquestioned merit. Owing to the comparatively short time treated timber has been used in this country, and the long time required to get results from service tests, many of our conclusions are based on European results. We have, however, records in this country of creosoted piling resisting teredo and decay for twenty-five and thirty years in waters which would destroy untreated timber in a few years; while many treated cross-ties have been in track ten to fifteen years without signs of deterioration. In France, an average life of about twenty-eight years is obtained from creosoted beech ties, which would not last over four years, untreated.

Experimental preservation of woods was attempted in England more than one hundred years ago, and commercial treatment of timber has been practiced in Europe for over fifty years. Out of

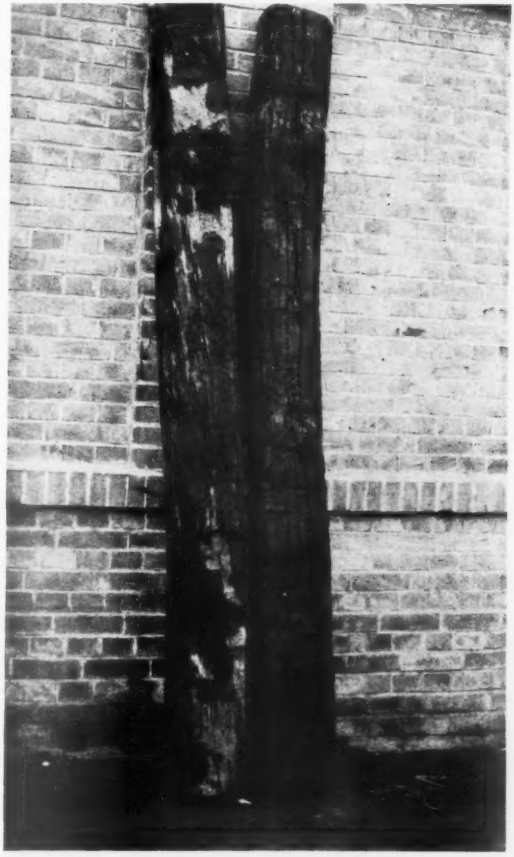
CROSS TIES PILED FOR SEASONING IN WOOD PRESERVING PLANT YARD.

the large list of preservatives which have been tried, long experience has reduced the number which are of accepted value to two; namely, coal tar creosote and zinc chloride. In 1910 the consumption of creosote in the United States totalled 63,266,000 gallons, of which 38,640,000 gallons, or 69 per cent, were imported; while zinc chloride was used to the extent of 16,802,500 pounds. The latter, which is a soluble mineral salt, leaches out of the wood in wet climates, and is of greatest value in arid regions. Creosote is the preservative most generally used, present developments indicating the decreasing use of zinc chloride alone; although in mixture with creosote, or with some heavy oil as a seal, it promises excellent results.

The methods or processes by which preservatives are introduced into wood involve many technical details which are not of general interest. Preservatives are applied by pressure, open tank, and brush application. Of these the first is of greatest value and most widely used, open tank and brush treatments being superficial and of value mainly where low cost is essential and facilities for thorough treatment are not available.

The usual type of wood-preserving plant is equipped with from one to five heavy boiler plate cylinders, from six to seven feet in diameter and about 130 feet long. The additional equipment necessary to operate the plant includes steam boilers, pressure and vacuum pumps, air compressor, storage tanks, etc. The cylinder has a heavy door which can be tightly closed by heavy pivoted bolts, tight-fitting gaskets preventing the escape of the preservative under pressure. The ties or timber for treatment are loaded on narrow-gauge steel cylinder cars, and a whole train—usually fifteen cars—is run bodily into the cylinder; tracks being provided inside the cylinder and the cars designed so that they just fit the available space. The heavy door is then closed and the hot creosote introduced from overhead tanks. Pressure is then applied and increased up to 160 to 200 pounds per square inch, or until the desired amount of absorption is obtained. The oil is then dropped into

CROSS SECTIONS OF BEECH TIE TREATED BY THE RUPING PROCESS AT STENDAL, GERMANY.



PINE TIES TAKEN FROM TRACKS OF PRUSSIAN STATE RAILWAY AFTER TWENTY-THREE YEARS' SERVICE. TREATED WITH ZINC CHLORIDE AND CREOSOTE.

an underground receiving tank, or forced back by compressed air, and the charge withdrawn. This covers the essential steps of the so-called full cell or Bethell process. Various modifications are made for special purposes, such as preliminary steaming, followed by a vacuum, to remove the saps; initial vacuum, before introducing the oil; and a final vacuum to recover surplus oil. An economical process, known as the Reuping, requires an initial air pressure, followed by the introduction of the oil without relieving the pressure. At the end the compressed air in the wood forces out 40 to 60 per cent of the oil originally injected, leaving only the cell walls impregnated; hence the name "emtpy cell" process. Another process designed for a reduction in initial cost is a mixture of creosote and zinc chloride in solution, the two liquids being agitated and kept in emulsion by a rotary pump, through which the entire mixture, in the cylinder, passes every seven to ten minutes, even while under pressure.

The tendency in this country, where timber is still comparatively cheap, is to economize in the treatment by using

partial doses of oil, or mixtures which are cheaper than pure creosote. In Europe much heavier treatments are given, the practice on most of the French and English railroads, for example, being to impregnate sleepers practically to refusal. The Prussian State Railways, on the other hand, have recently adopted an empty cell treatment. The amount of preservative should be determined largely by the traffic and maintenance of way practice. On most American roads where cut spikes are used and the tie-plates are small or eliminated entirely, it would be folly to inject enough preservative to protect the tie from decay for thirty years and have it wear out in a third of this time. In Europe, where screw spikes and heavy plates or chairs are standard equipment, mechanical wear is reduced to a minimum and a more expensive treatment is justified. It will be a mark of distinct progress when American roads protect their ties from wear as well as from decay.

All woods do not have the same capacity for absorbing preservatives, owing to differences in the wood structure. Red oak will treat readily, while white oak and chestnut absorb only a superficial coating, even under high pressure. The sapwood of most species treats easily, but the heartwood of most timbers is resistant. The best results can be obtained only by thorough knowledge of the characteristics of various woods and manipulations of the treatment accordingly.

Wood preservation has become a commercial necessity, and because it saves the wood consumer dollars and cents, will remain an important industry. The railroads and other large wood-consuming corporations incur heavy initial expenses for plants and increase their current costs on wood material in order to profit by reduced annual charges through the longer life of the material. The small wood consumers cannot take advantage of the pressure treatment unless near a commercial plant; but the brush and open tank treatments are available to farmers, fruit growers, and others who need to preserve their posts, stakes, lumber, etc. Whatever is done by corporations or individuals, the broader aspects of wood preservation should not be overlooked, since any reduction in the drain on the forests will tend to conserve the timber supply and keep prices down. Low lumber prices, in turn, mean conservation in the pocket-book of every individual citizen.

PENNSYLVANIA'S TRADE.

Lumber and timber industries in Pennsylvania employed on an average of 32,073. *In the census of* 1859 *the lumber industry of Pennsylvania ranked first among the States. In* 1909 *the production of lumber was* 1,462,771,000, *which was a decrease of* 36.3 *per cent. from* 1899. *About* 56 *per cent. of the lumber manufactured was soft wood; oak* 20 *per cent.*

KENTUCKY'S STATE FORESTER.

At a recent meeting of the Kentucky State Board of Forestry, Mr. J. E. Barton, formerly connected with the U. S. Forestry Service, was elected State Forester for Kentucky.

FIRE PREVENTION.

The Pacific Logging Congress believes in the expenditure by the various States and Provinces of liberal and adequate appropriation for forest fire protection. To this end the Congress has indorsed the efforts being made for the creation of field military posts, near the national forests, with a view of utilizing the national troops where emergencies arise in the protection of the national forests from fire.

METHOD OF FORESTRY CAMPAIGNING

By E. T. Allen

Forester Western Forestry and Conservation Association

I PROPOSE to discuss not needs or methods of better forest management, but means of making propaganda for these things effective, or, in other words, the technique of the publicity and educational work that is almost as important as forestry itself. The Western Forestry and Conservation Association has probably devoted more effort to developing this line of action than any other agency. Its success in moulding public and legislative sentiment is the reason I have been asked to describe some of its methods in the hope that they may suggest something of help elsewhere.

It may be well to begin by describing our organization itself, both because it might be duplicated in some localities and to show wherein its methods may not be practicable for ordinary forestry associations dependent upon small dues from a large but somewhat passive membership. It has no individual members, but is a league of over a dozen local organizations extending from Montana to California. Two are State conservation associations with miscellaneous membership, but the rest are all working patrol associations maintained by timber owners. These constituent locals are actual protective agencies, spending from $250,000 in a favorable year to $700,000 in a year like 1910 for patrol, fire-fighting and building trails and telephones. They patrol nearly 20 million acres and with remarkable success, for being unhampered by politics or the economical vagaries of appropriating legislatures or congresses, they have developed probably the most efficient and perfectly-equipped systems in the United States. They are financed by pro rated assessments upon the members' acreage, varying from 2 to 10 cents an acre, according to season and locality.

Attending to local field work independently, these fire associations levy an additional acreage assessment for the Western Forestry and Conservation Association in order to have a clearing house for ideas and experience in fire matters, facilities for cheaper and more effective educational work than they could do alone, and a medium for developing co-operation with State and Government. The leading State and Federal forest officials are members, ranking in its meetings and on its committees with the delegates sent by the constituent private organizations. The result is a triple alliance; working in the utmost harmony for the common end of forest preservation, accorded thorough public confidence, and financed chiefly by forest owners for utilizing opportunities afforded by all three. It has a voice in all official councils and measures, as well as in the press and with lumbermen and public, because it is non-partisan and particularly because it represents those who spend money and do things rather than those who merely ask others to do and spend. An illustration of our standing was afforded in 1910 when, upon the request of our president, Mr. Flewelling of Spokane, President Taft ordered out the army to fight fire.

In gaining this power and in using it our first principle has been never to seek any end not of general benefit or to show discrimination for or against State, Government, lumbermen or public. We are equally without sympathy for the propagandist who locates all forest evils in the greed of lumbermen and seeks remedy by resent—breeding impracticable compulsion, or for the unreasonably individualistic lumberman who does about equal harm by his own bad methods and the retaliation he draws upon his industry. We recognize no difference of importance between increasing the lumberman's de-

WORK OF A VERY DESTRUCTIVE FIRE IN FOREST BORDERING A LAKE.

A TYPICAL FOREST SCENE IN EASTERN WASHINGTON.

sire to protect and properly utilize the forest resources he holds in trust and increasing the public sentiment which will encourage him to do so. We believe that mutual benefit lies in mutual understanding, confidence and co-operation.

In bringing before forest owners the actual profit of better forest management and the equal advantage to them of earning popular credit by it, we depend little upon the conventions, associations and publicity methods commonly used to arouse forestry sentiment in the general public. We break into his own trade meetings and journals, where he has to listen, and take care to show that what we say is with full knowledge of his many problems. We write him letters and circulars, but do him the honor of making them as thoroughly his as would be a talk across his own desk. We ask him to make no sacrifices for posterity that we are not making ourselves, but we do try to show him that he can do much without sacrifice or at a profit. Particularly, when we do get his money or backing, we try to give him tangible return in something he really wants, like fire protection, as well as in things we think he ought to want.

If he wants to interest his neighbors in protection, we help him get them together, draft one or two prominent men who have tried it to go along and tell how it worked, carry with us an array of practical figures on cost elsewhere, and practically bulldoze the gathering into organizing a modern co-operative patrol. After they try it, they continue, and we see that they get a copy of every new idea in fire work that is ever evolved afterward anywhere. If a new spark-arrester is invented, they get a description of it. If someone discovers that powder will throw a trench faster than shovels under certain conditions, we tell them about it. If a supreme court passes on some doubtful point of a fire law, we analyze the decision and send it around. If a law is inefficient generally, we write a new one, organize a campaign for its passage, and pay the bills.

But probably you are more interested in methods of general public education. In this we follow the advertising principles of continual effort to keep the impression from fading, and of novelty to insure attention. Probably the first form of anti-fire publicity was the old-fashioned fire-warning synopsizing the law and its penalties and printed on cloth for durability. We originated departure from this to a poster saying little of the law but bearing catchy epigrammatic appeals to the reader's common sense and personal interest, and printed on paper so it can be replaced with a new one next year. Each year we use different text, type and color, and are now branching into pictorial signs depending little upon text of any kind.

Each spring we issue immense numbers of short circulars, with paper, colors and picture covers so attractive that they are not quickly tossed away, taking up in some new form the importance of forest protection to community welfare. One year it may be straight narrative, another a cathecism with answers, another a parallel column device. Always different, always catchy. These are distributed in countless ways—as letter fillers by business houses, in railroad folder racks in public places, handed out or enclosed in packages by merchants, attached to documents and licenses by county officials, distributed from pulpits by ministers, dropped in rural mail boxes by riders, left at houses and on hotel tables by hundreds of fire wardens. Almost anyone will help if you give him the material and suggest how.

Similar distribution is given small gummed labels bearing terse sentences or symbolic pictures and issued by hundreds of thousands. They are placed on envelopes, advertisements and the like, also stuck on walls, signs and posts.

Every spring we get out something especially designed for school children, both to get them thinking rightly and to be shown their parents, and the State school authorities instruct the teachers to distribute these. Last year it was a sort of catechism with a picture cover, this year a little story investing a tree

PART OF A STAND OF YELLOW PINE IN SOUTH-EASTERN WASHINGTON.

with personality and carrying it through all its forest struggles. These reach hundreds of thousands of children and the distribution of so many tons of material to the teachers by small mail and express packages is a serious undertaking. We also find a good opportunity in Arbor Day ceremonies, preparing material to be issued by State school superintendents in a special bulletin to teachers with instructions to make it part of the regular program.

One of the most pretentious projects we have undertaken is a technical manual of forest management for the Pacific Coast. Dealing not only with forest economics and protection, but even more with silvicultural problems and reforestation possibilities, it is practically the first western book of the kind and has wide circulation. It is used as a text-book in every American forest school, is in most important libraries, and was listed by New York State among 1300 best books out of 11,000 printed in 1911. Peculiar value of such a book as a sentiment-maker lies in that it carries forestry to the lumberman who would not read it elsewhere and carries his practical problems to the technical forest school.

We find both daily and technical press of value almost exactly in proportion to our systematizing its use. It is of great importance to reach the small country papers whose readers both use fire and exert much influence in legislation. To keep their interest we give them real news, using it as a peg on which to hang propaganda matter, and do this regularly. We send out to all our local associations and to State and Government officials blank forms asking for information, as for example on the fire situation at given times, and have these returned to us simultaneously so we can compile accurate up-to-date bulletins. These are so written that they can be shortened without rewriting and go promptly to about 800 papers with a release date like Associated Press dispatches. The papers know they can depend on these bulletins and use them widely. Occasionally we accompany them with lighter material like verse, which is very effective, or with editorials. I have yet to see a single unfavorable expression upon the Western Forestry and Conservation Association in any newspaper and we get many letters and notices of approval. I attribute much of this good will to our systematic way of giving them news that they cannot get elsewhere, when it is new and in newspaper style.

Another publicity method both cheap and effective is to furnish material to others who will use it at their own expense over their own name. We send copy for fire warnings to State foresters and associations, suggest notices to be put up by railroads in cars and stations, and devise mottoes to go on checks and stationery. Every transcontinental railroad traversing our territory has our fire warning material in its summer time-folders. Telephone companies print it in their directories, and tell readers that exchange operators will put them in touch with fire wardens. Counties put guide-boards at road-crossings saying it is 10 miles to a certain town and do not start fires on the way. Many official State reports by boards and commissions present forestry material exactly as we write it for them. Speeches and reports before women's clubs and miscellaneous conventions are often supplied by us in full to the speakers or committees called upon to investigate the subject. Let any agency establish willingness to furnish such matter, and a reputation for absolute reliability and impartiality and it soon reaches audiences it could not appear before in any other way. Similarly it is often better to give a good article to a staff newspaper or magazine writer than to submit it yourself. He makes the money, but your doctrine appears without the discount of your own known special interest.

I could continue the list of such suggestions almost indefinitely, including calendars, framed pictures teaching some fire lesson to be put up in school houses, special folders to be handed patrons of garages and livery stables, combination game and fire law cards to be given sportsmen by gun-stores and license officials, the printing of like material on guide maps, stamped plates to

FOREST OF NOBLE FIR, HEMLOCK AND RED FIR IN OREGON.

be attached to logging engines, cards bearing fire wardens' addresses to be tacked up near telephones, and many others. I think, however, that those already recounted will be sufficiently suggestive and I want to use the time remaining in speaking of the highly important subject of getting better legislation.

Neither my topic nor the time available warrants discussion of the policies to be expressed by forest laws, but with respect to engineering their passage, I can say that our experience teaches two cardinal principles of success. Harmonize and organize your support early and thoroughly. Do not depend upon lobbying, but exert your pressure through the legislators' constituents at home. Were I to outline a legislative campaign it would be about as follows:

Complete your bill two or three months before your legislative body convenes, but not before you have asked advice of all factions it affects and made it satisfy the sane majority of each. If it doesn't, the chances are either that it is not a good bill or that you have not learned to extol its merits convincingly. Then print it, with an attractive cover bearing the official endorsement of all the influential agencies you can elist. This disarms suspicion, also the human tendency to tinker with it which will keep cropping up till it is either dead or signed. Precede the bill itself by a lively argument to engage interest, follow every section with full explanation of its particular need and meaning, and finish the booklet with a dire prophecy of what will happen if it is not supported.

Send this circular to everyone you can think of; lumbermen, ministers, women's clubs, bankers, merchants, newspapers and, of course, the legislators themselves; always with a special letter making an individual appeal for support based upon the recipient's vocation, and asking if he has any changes to suggest. He seldom will have, so you take few chances, and the majority are pleased. Anyway, you are out in the open. No one can say later he does not understand the bill. By time the fight is really on you have discovered your opposition and how to meet it—a most important point.

In the meantime you have been perfecting mailing lists of two kinds. One is the widest possible, classified by vocations or other distinctions suggesting special arguments, and the stationery and signatures of the letters you send are as varied as the institutions you can get to let you use their prestige in this way. These addresses are classified again by their representation in the legislature and each receives at least one letter containing stamped addressed envelopes to his own representatives, with a request to write these demanding support of the bill unchanged. The majority will comply just because you have trusted them with a few postage stamps. The second list is of one or more people in each town whom you appoint local agitators to follow your instructions at any time without question. It is not hard to get such a list of lieutenants if you start your general letter writing campaign early enough. It develops through the replies you receive.

When the bill is introduced, do not lobby—at least not much. Ask every member whether he is for or against it, give him another of your printed explanations of it, and leave him pleased because you do not talk him to death when he has important business on hand. This is practically the sole job of your lobbyist: to advise you who is so sure to support you that he can be safely neglected, who needs pressure, and the stage of your bill every minute—its progress through committees, etc. With this information you marshal pressure from outside. What the reluctant members need is not your arguments for the bill, but expression from their constituents. You keep on writing letters by the hundred or thousand, occasionally sending out a flurry of telegrams to indicate urgency, always telling the recipients the particular members they are to write or wire to and what is needed, even if it is only to hasten the bill through a committee. And always emphasize that the bill is to be left unchanged.

If you have never tried such a campaign, two things will surprise you—

the readiness with which people will respond to suggestions that are exceedingly definite and somewhat flattering in assuming their influence is valuable, and the effect of this home endorsement not only in passing a measure but also in keeping it unchanged. One of the greatest perils of a forest bill is that it may be modified to make the resultant system a political machine. In dealing personally with members who attempt this, you are almost helpless if they make it a condition of their support. It is very different when they are obliged to offend constituents by defying their specific requests.

There are, of course, many additional devices to be employed. Wholesale and banking houses may be induced to request help for your bill as a personal favor of all their out of town connections. Friendly newspapers may use editorials to be clipped and sent each legislator. We once successfully killed a charge that a fire appropriation would benefit timber owners at the expense of the farmer by having placed on every member's desk a cartoon of a settler's house being destroyed by fire, surrounded by reproductions of dozens of actual clippings all describing loss of life or property by settlers, and bearing the legend "to vote against the fire bill is to vote for this." I cannot review all such devices, but the summing up is this: Do not rely on eleventh-hour lobbying with a busy legislature. Give your measure the earliest and widest explanation and systematize to the last degree getting the effectively applied endorsement of every man, woman and child you can reach.

FIRE DAMAGE SMALL

THERE has been less fire damage to timber in the Northwest this year than any previous year since the Western Forestry and Conservation Association has been organized, according to a statement by A. L. Flewelling, president of that organization. This year, he says, the fire loss has been practically nothing, in June there were a few fires on the coast, but in the Inland Empire, Montana and Oregon the damage has been almost nothing. Continuing, Mr. Flewelling said:

"The fact that the summer season has been a moist one is, of course, one of the principal reasons. There are, however, three other reasons that may help to explain the condition of affairs this year. The patrol system and organization of the timber protective associations have been perfected to a degree never attained before. Most of the railroads have adopted oil fuel, doing away with the locomotive spark as a fire cause. The campaign of education that the association has been carrying on for years is beginning to bear fruit.

"Settlers and campers are exercising more care in leaving fires and are more ready to co-operate with the lumbermen in reporting them." The cost of the patrol service maintained this year has ranged from 2 to 3 cents per acre in north Idaho. Mr. Flewelling said: "A year ago the average assessment was 3 cents, while in 1910, the year of the big fires, the cost ranged from 12 to 15 cents per acre. This year most of the patrol forces have been used in building telephone lines. These lines and lookout stations have been established in sections never reached before."

E. C. PEGG APPOINTED.

Mr. Ernest C. Pegg has been appointed instructor in forestry at the University of Missouri. Mr. Pegg was graduated from Wabash College and from the Yale Forest School in 1911 with high honors. Since graduation he has been in the employ of the U. S. Forest Service, with headquarters on the Jemez National Forest, Arizona.

HENRY E. HARDTNER, PRES., LOUISIANA FORESTRY ASSOCIATION.

SOUTH'S TIMBER DISAPPEARING

By Henry E. Hardtner,

President Louisiana Forestry Association

IT is a well known fact that the forests of the South will be completely exhausted inside of fifteen years at the present rate of cutting. I have studied forest conditions in every Southern State and have conversed with well informed lumber operators and timber owners and am fully convinced that the present supply of virgin timber is nearing exhaustion. It is sad for one who has grown up in the forests and who saw them in their virgin splendor to witness their complete destruction. Yet, we must consider that the trees are ripe and full grown and should be utilized to the best advantage, and that it is not criminal to denude these magnificent forests. Where we deserve censure is in failing to enforce reforestation on lands chiefly valuable for timber culture.

The present rate of cutting timber for

A FOREST SAW MILL IN THE HILLS OF EASTERN TENNESSEE.

ERODED SLOPE, FORMERLY HEAVILY WOODED, IN WESTERN NORTH CAROLINA.

the market will decrease from year to year from now on. The highest average has been reached—the forests are now in the hands of actual operators who of all manufacturers are forced to purchase raw material for years in advance in order to insure a safe return on the great cost of erecting mills, houses, railroads, etc. There will be few if any sawmills erected by new companies. A number of large mills will go out of commision year after year because of the exhaustion of their timber supply—the companies now operating will not increase their output—consequently the life of our virgin forests will be prolonged. Another factor in prolonging the life of virgin forests will be a reasonable price for lumber which will enable the operator to make a profit. A reasonable price for lumber will enable a mill man to cut 25% more timber from his lands. There will be no more profit for the manufacturer on the actual cut when the average price f.o.b. mills is $20.00 than when the average price is $15.00 for this reason—it will be more expensive to save the extra 25% increase in stumpage which is now wasted because it can not be profitably handled. The average lumberman is a true conservationist. He does not wish to waste any product of the forest—but he can not operate his mills many years at a great loss. So when the average price of lumber is $15.00 he is forced to leave 25% of very low grade lumber in the woods. His average per cent of upper grades is much larger on a $15.00 average than it is on $20.00. A $20.00 average for next three years—a $25.00 average for the five years thereafter and a corresponding increase from year to year will enable a person to reforest his denuded lands and grow trees at profit and as a safe business investment.

To sum it all up—an average price of $20.00 will enable the lumberman to get 25% more lumber from his lands,

thus increasing the life of the virgin forests ten years. It will also enable and encourage the land owner to grow trees for the market so that when the virgin timber is gone there will be new forests to take their place. The cost of growing timber where the State fixes a valuation of one dollar per acre for taxation purposes on the land for thirty or forty years and does not tax the growing timber is as follows:

Assessed value $1 acre for 30 years and compound interest at 6%	$1.67
Present value of land	3.00
Cost of planting trees per acre	5.00
Compound interest for 29 years	37.94
Care of timber at 2 cents acre and compound interest	1.67
Total cost	$49.28

There will be 5,000 feet per acre in 30 years' time at a cost of about $10.00 per M. feet. It's a good investment—a good clean business to engage in.

IS LUMBER A CRIME?

By GEORGE H. HOLT

ONE man has made a national newspaper reputation by declaiming against the "Criminal Match." Another has made a tour of the country to exploit his catch phrase, "The shingle roof is not a covering, but a crime."

The Fire Insurance propaganda with its ninety-odd class-periodicals is promoting mass meetings in every State and city denouncing all forms of wood structure and utility as guilty of the "National Disgrace" of fire waste, and denouncing all responsible officials as criminals who do not use their official positions and power to prohibit its use.

The sensational press has heedlessly and ignorantly joined in the hue and cry, and the unenlightened portion of the "dear people" which takes its tone from head lines is hurling stones and clubs and epithets at the "Lumber Trust"—that mythological, disembodied Banshee—in blissful ignorance of the facts and of its own best interests.

Our natural enemies, the purveyors and manufacturers of competing material, and novel, untried substitutes, are spending mints of easy money in advertising and promoting the sale and use of their pet fads, and are not conscience-smitten when they decorate their pronouncements with all the lurid colors which they can borrow from their evil-disposed or ignorant collaborators.

Building ordinances and restrictions are enacted and enforced upon the false assumption that if matches and mice and shingles and lumber and every form and use of wood were prohibited, property and life would be forever safe from the Fire Hazard, and everybody would be happier.

In this hour of unrest, when any demagogue can get a hearing by proclaiming that "Everything that is, is wrong," the likelihood is that we are on the road to destruction of much that is good, along with some things that are bad. A wrong diagnosis leads to a fatal disaster, when a right diagnosis might prolong life and happiness.

What about the criminal match? The tests made by the Underwriters themselves disprove that charge. They show that "safe" matches share the responsibility equally with "unsafe" matches. It is the careless use of matches, not the matches themselves that should bear the blame.

The actual tests of "mice and matches" and "rats and matches" reduce to ridicule the tabulations of losses from those causes, although they have become a standing scare-head in all annual reports of fire loss.

What about the "Criminal Shingle"? There are no statistics worthy of the slightest respect which tend to justify that false alarm. Think of the eleven million and odd buildings in this coun-

try and consider what an enormous percentage of them are and have been roofed with shingles. How many cases have come under your observation in which the shingles were the cause of the fire? How many cases in which the shingles actually spread the fire to adjoining properties?

The great values and the great losses by fire in this country are not in shingle-roofed buildings, and never were.

If shingle roofs are really the "criminals" that they are painted why do not the statistics show it? Why do the insurance companies compete so strenuously for frame residences, farm houses and barns, school houses, churches and public institutions, roofed with shingles, if shingles are "Not a covering, but a crime"? Why do they rate these properties among the lowest in the list, and then give away from 40 to 55 per cent of the premiums to get the business, if "Shingles are a crime"?

Where was the "Conflagration" for which shingle roofs were responsible? Doubtless some fires have been started in shingle roofs and some have been communicated in that way, but I do not know of any statistics which tend to show that shingles are a peculiarly bad hazard. The analysis of thousands of fires attributed to "sparks," taken as they run, shows as many fires in buildings not having shingle roofs as in buildings having shingle roofs. This fact is noteworthy, because there are a greater number of buildings roofed with shingles than with any other material.

It would be natural to expect, therefore, that any comparison by numbers of fires would show a greater number of fires in shingle roofed buildings, but that is not the fact in this case.

The appeal to experience and to statistics alike acquit the shingle roof and damns it defamers.

How about structural uses?

Wood construction is as old as the human race. Fire proof construction may have had "a look in" in the Stone Age, but it was not a winner in the race for civilization. As for iron and steel and concrete and plaster and cement, their story is a short one, and their comparative merits as all-around and economic and livable are not established.

Admit that they have certain distinctive merits under certain conditions and limitations, and you have given them all the credit that they are entitled to.

It is certain that iron alone is an unfit substitute. Examine any annual report of fires in a State or city and you will find abundant evidence of that fact.

Concrete and iron, properly combined and proportioned, are a worthy pair for certain purposes, but, although their number is less than one per cent of the whole number of structures, they contribute a very large percentage to the fire waste.

Fire and electrolysis and water and changing stresses are fatal to their life and usefulness. As to the safety of life and limb in unsprinklered "Fireproof" buildings, the indictment against them is more terrible than against any other class.

And yet we would not say that an unsprinklered fire proof building is a "crime."

Their record in every great conflagration is a record of total loss of contents, and for the most part, worse than a total loss of structure.

A sprinklered fire proof structure, properly constructed, is about an equivalent of a "mill-construction" (wood interior) building, from the fire hazard standpoint.

Edward Atkinson always held that the mill construction was the better, and for many years discriminated against the fire proof sprinklered in favor of the mill sprinklered structure.

The records of the New England Factory Mutuals are a monument to his sagacity in that respect, during his life time.

What about timber construction?

To paraphrase Daniel Webster, "The world knows it by heart." Dry wood will burn. Wet wood will not. You must evaporate the water first. The Automatic Sprinkler solved that problem. It wets the wood while the fire is small, and keeps it wet until the fire is

out. There are some sprinkler failures, in both fire proof and timbered buildings, due to defects of construction or to accidents which cripple the equipment, but the actual experience of fire loss in thousands of sprinklered timbered structures, carrying hundreds of millions of insurance, is below one per cent. As these buildings are mainly factory buildings, housing inflammable materials and operating machinery, all of which contribute enormously to the hazard, the record is a phenomenal one, and the case is proved in favor of the reasonable use of wood in structural work. The great majority of fires start in contents or equipment—not in the structure. If all buildings were properly sprinklered, and the sprinkler equipments properly maintained, there would be no spreading fires, and consequently no conflagrations.

The fads of wired glass and metal trim and furniture would be relegated to the scrap heap, and buildings would be livable and beautiful and economic, and life and property would be safe from fire.

But that is the extreme.

It is not necessary or desirable to go that limit. It is only necessary to protect congested areas and values and occupancies, leaving the small and moderate hazards to the control of a fire-fighting force of moderate, though ample, size to subdue it.

This condition can be established in any city in a short time, and without adding any burden not already borne. It is what I have called "Normalizing" a city—that is to say, reducing its hazards to a normal size, so that any possible loss would fall within the limits of a profitable relation between cost of construction, maintenance, protection and loss without disaster.

We have no quarrel with those who seek by fair means to sell competing materials. We have no quarrel with those who seek by fair means to enlighten the public to a due sense of its responsibility for fire waste. We have no quarrel with those who seek to bring the public mind to a state of carefulness and caution in the matter of fire hazard.

We do not urge the exclusive use of wood for all purposes.

We do not object to reasonable restrictions upon unfit methods of construction or use of materials.

We do have a right to denounce a false propaganda, which, to serve its selfish ends, defames us and our industry with reckless and unjustifiable misstatement of facts, and by playing upon the prejudices of the uninformed and gullible portion of the public.

We perform a service to the public and to the great number of persons who are engaged in collateral and related industries when we do so, as well as to our own great host of citizens whom we are proud to call our "fellow lumbermen."

What we need is an unbiased and competent investigation and report, under the authority of the National Government, which will ascertain and disclose the facts in an adequate and trustworthy manner.

QUEBEC'S LUMBER RESOURCES.

The timber resources of Quebec are enormous, though greatly diminished in past years by forest fires. The privately owned timber lands comprise about 6,000,000 *acres and are able to supply* 500,000 *to* 1,000,000 *cords of wood per annum for years to come. The Island of Anticosti alone is able to produce* 80,000 *to* 100,000 *cords per annum for years, a good portion of which, however, will probably be converted into pulp in the near future, as a large mill is now in process of erection there. Pulp mills are also in process of construction in other parts of this district, so that the pulp industry, especially in this district, is bound to witness a great boom in the near future.*

AMERICAN FORESTRY

By Jerome H. Sheip
Philadelphia, Pa., Box Manufacturer

IT is particularly gratifying to note the growth in technical efficiency by which we are rapidly realizing the best ideals in the management of our public forests. We recognize that a great field of usefulness awaits our efforts in bringing about a more economic management of private forests. The forest reserves which were created in 1891 and later more appropriately named "National Forests," have been increased in area, and now include about 190,000,000 acres. Many State Forest Reservations have been created and established, so that, at the present time, about one-fifth of the forest area in America is owned by the public. To this extent, a great system of management has been established, looking toward the protection, improvement and wise use of our timber supply, which has been insured for the present and future benefit of all the people—aiding private owners in reforesting waste lands and in educating the public in the best methods of handling timber lands and providing efficient fire protection.

JEROME H. SHEIP.

The total amount of timber cut in the United States in 1900, was thirty-five billion feet; in 1905, thirty-eight billion feet; in 1909, forty-five billion feet. These figures show an enormous increase demonstrating beyond question, the importance of extending the practice of forestry to commercial lumber operations. Business in a large measure, is now hospitable to forestry—seeking to understand its principles and find out how they may be applied, and the most cordial, thoughtful co-operation is due from the forestry profession.

While it is true that some of the greatest fortunes in the country are based upon lumber, they have been made by treating lumber as a speculation and not as a business, by holding and reselling, not by cutting. The writer contends that if the timber owner could afford to wait fifteen years, if he charged his investment at six per cent and compounded it annually, and sold at the end of that term, his profit would generally be greater than if he had cut his trees into lumber. This practically means that the saw-mill man is giving away his manufacture for less than it has cost him, as he is not getting the appreciated price of his logs. The average way the man who owns both a mill and a forest figures his cost is this: he buys his timber at an estimated stumpage value of $2 per thousand. He puts up a saw-mill after waiting several years, and by the time he is ready to operate, the general price for stumpage is $5 per thousand; but he argues, I paid $2, and therefore

stumpage is put on his cost records at $2 instead of $5, because he is selling the timber to his own mill instead of to somebody else. On this miscalculated cost he makes a price that gives away the manufacture for less than it cost him above the price of the timber.

Nor is this all; the lumberman is getting nothing for the risks of engaging in one of the most precarious and difficult of operations. In the South, which engages principally negro labor, insurance men tell us that more than ninety per cent of the lumber mills burn out every ten years, and no matter how thoroughly insured the lumberman may be, he will certainly lose in a fire. For the ability, the genius who can conduct the lumber business as a permanent concern under the present conditions has yet to be discovered. The saw-mill as the center or focus of the business, possesses this peculiarity; when it is placed in a locality, it immediately begins to cut a circular swath about it. As more capital is invested in the plant to make it more efficient, it means that the life of the plant is being shortened, as the swath in which it will pay to operate will be cut more quickly, and a move will be necessary the sooner, with all the loss incident to readjustment and re-establishment. The question in such a case is how to charge depreciation, for as the plant has only a running value, every doubling of efficiency of daily output, by a doubling of capital invested, would mean the quadrupling of depreciation. In other words, the fact that our forest policy is based upon a plan of depletion, has made the keynote of the business "cheap, inefficient and temporary." Like the Nomadic Indian, we have spread our wigwam upon the fertile prairie, and when the game was hunted out, we have moved to more fertile fields. This lack of permanence, or even discouragement of permanence, has been the bane of the saw-mill business during recent years. The fact that sawmilling has been based upon the premises of a change of locality each five or ten years has deterred the most valuable type of conservative business man from entering it as his life work, and invited speculators who have exploited the natural resources with little thought beyond the material pleasure of the day.

We shall always have the speculative element in our midst, but the men who represent it should not be permitted to manage as a private business what is a vast matter of public concern and what will be so difficult to replace when lost. It is not only that when the present crop of trees is cut, it will take approximately a century to grow a new merchantable stand but that it will take two or three centuries to return to the quality of our present virgin timber. Forests are not merely trees; the aggregation of many trees in one place creates forest conditions, and betters the timber for commercial purposes. These forest conditions have to do with such factors as soil cover, constant shade and constant reproduction. Once the sun is permitted to touch the soil and dry it out, we must begin from chaos again. Nor is the denudation of the soil a matter merely of taking off so many trees, as we are informed that the forests are watersheds acting as balance wheels upon the inequalities of climate and that if the tree cover is removed, we shall be exposed to the violence of alternate freshet and drought.

These are the conditions that have brought the issue of conservation to the attention of our people, and made it and Socialism the paramount and only really important political issues of the day. The conservation of forests is but a branch of the large general movement for the conservation of everything from child life to coal smoke; it means that instead of doing the most obvious thing in a tremendous hurry, we shall, in the future, calmly weigh and plan to what end we are going. The trained forester feels that in an ideal world that nation would be happy whose government realized that the great public necessities which span more than one generation in their circle, should be placed beyond the greed of any one generation, and as the national government is the most permanent element in our civilization, it is most fitted to exer-

cise this function. As this was not realized a century ago by the framers of our Constitution, the forester now asks that the same step be taken as in all other business—to stop and inventory our methods, in an attempt to remedy the evils that will no longer be glossed over. As a first step to this, we are to set aside certain lands that we can still obtain, as a temporary injunction to further abuse. Where President Taft has erred, with all good intentions, has been that after certain lands had been closed by a free interpretation of an act which gave the President power to close those lands, he threatened to destroy the entire forest policy of the nation by returning them upon a technicality. Technically and literally, he was probably right, but no technicality could restore the land to us, once it were lost.

Coincident with this movement for technical and scientific forestry has been another quite as important which has taken its initiative in the practical commercial world of affairs—conservation by conversion of waste into by-products. Not all of the forest trees are considered valuable for commercial purposes and as we have weeds springing up among the lower plant life of the soil, we have weed trees. Examples of this of recent date are the use of beech, and tupelo, and the treatment of discarded species of pine with preservatives such as creosote. Some twenty years ago, not more than half of the trees were taken down at the first cutting, as the rest were considered useless. Of the trees that are taken from the forest, not one-half of the original volume goes into the final product. The roots and branches make up one-third or more of the woody volume, but are left in the woods, while the dust taken out by the saw, the slabs and trimmings reduce the volume an additional fraction. Just recently, we have found that all or part of these unused pieces yielded paper pulp, alcohol, resin, turpentine, tannic acid, and the day is doubtless very near when the sawdust burner will be considered a public disgrace, when no saw-mill can be run profitably without working up its waste; or we may see the day when a saw-mill will find it profitable to burn coal under the boilers in order to utilize the sawdust.

From conservation it is not a great step to the exercise of forestry as a science. The final idea of forestry is to treat trees as a soil crop, as grain is treated, with this difference—the time of rotation. Ordinarily the time of rotation for a soil crop such as grain or fruit is one year, but in forestry this is increased by one hundred or more fold, or three natural generations. This, however, is counterbalanced by the stability of the crop and the certainty of return, for the forest has but three enemies, fire, wind and vermin, reduced under scientific forestry to an absolute minimum. By certain technical and not very complicated methods, forestry keeps a continuous growth of trees of all ages from seedling to mature trees in its forest, and endeavors to cut each year only a number of large saw-log trees corresponding in volume to the amount of woody material put on by the entire stand for the year; it keeps the ground shaded, and finding out the pecularities of the soil, favors those species most fitted to it. It would probably be impossible to get a private individual to engage in such an undertaking from a purely commercial viewpoint, as the amount of capital tied up at compound interest for a rotation of even sixty years would be very considerable. We must look to the government to come forward and, if not take charge of such an undertaking, at least to encourage it by beneficent laws that will overcome the present handicap of unscrupulous business over public spirit. We have given protection to develop many unworthy infant industries by a protective tariff, and yet here the most worthy of all industries, in the most need of protection, receives no encouragement. The least the government can do is to relieve those who have placed their forests under scientific management, of the burden of taxes during the first crop rotation.

THE PRESENT STATE OF FOREST TAX LEGISLATION

By Fred R. Fairchild

Dept. of Economics Yale University.

THAT there exists a direct connection between taxation and forestry has been more or less generally recognized for some time. The exact nature of this connection, however, has never been well understood in this country. Persons interested in forestry have seen that taxation was a serious obstacle, and legislatures have frequently been willing to give relief by means of special legislation affecting the taxation of timber lands. In the absence of an understanding of the true relation between taxation and forest growing, this legislation has until very recently all gone off on the wrong track. The good results hoped for have not been accomplished and the problem of forest taxation is still unsolved, is in fact more pressing than ever before.

In what follows I shall undertake to describe briefly the present state of legislation in the United States affecting the taxation of forest lands and to show why the special forest tax laws enacted up to the present have not proved effective.

The taxation of forests is a matter of State and local revenue. There is no taxation of forests by the national government. The legislation is all State legislation. The basis of local revenue everywhere in the United States and of State revenue in very many of the States is the general property tax. Everyone is familiar with the principal features of the general property tax. As a rule all property, real and personal, tangible and intangible, is subject to taxation, unless specially exempted by law. Forest lands are subject to the tax the same as any other kind of wealth. The law requires that the actual market value shall be assessed, which in the case of forests means the full value of land and trees. Of course it is a matter of common knowledge that the laws are not enforced as regards the requirement of an assessment at full market value. The tax is collected annually at whatever rate is required to raise the necessary revenue for the town, county, State, and other public bodies depending upon the general property tax.

This, in brief, is the normal tax system to which forests are subject in the United States. Only where there has been special legislation are forests treated differently from other kinds of wealth. Of the forty-eight States of the United States, thirty-four tax forest lands under the general property tax in exactly the same manner as other lands.

The other fourteen States have enacted special legislation affecting the taxation of forests. These States are Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Alabama, Michigan, Wisconsin, Iowa, Nebraska, North Dakota, and Washington. The idea in the legislation of all of these States has been to encourage the planting and cultivation of trees or the general practice of forestry by offering special inducements in the way of reduced taxation. These concessions take the form of entire or partial exemption from taxation, rebates of part of the taxes, or bounties to be deducted from the taxes. The method usually employed is that of tax exemption. The plan of a rebate is used in New Hampshire; North Dakota uses bounties, while Wisconsin uses both exemptions and bounties. In some of the States there are two or more distinct laws, not always entirely consistent with each other. In most cases the statute is limited to plantations, and in five States the forest must

be established on land that is not wooded at the time.

The commonest form of tax concession consists of a complete exemption from taxation on both land and trees for a definite period of time, ranging from five to thirty-five years. The exemption begins either immediately after the land has been planted or set aside for the growth of trees, or after a certain period, measured either in years or in the growth of the trees. In other States the concession is by means of a rebate of part of the taxes for a certain number of years, as in New Hampshire, or by means of a bounty of so many dollars per acre to be deducted annually from the taxes on the land, as in North Dakota and Wisconsin. Usually the owner is required to manage the forest in accordance with regulations specified in the statute or under the direction of some State officer or board.

Only two States depart materially from this general plan. These are the States of New York and Michigan, whose legislation, enacted in 1912 and 1911 respectively, will be considered in more detail below.

Four States, Illinois, Kansas, Minnesota, and Wyoming, undertake to encourage the growth of trees by offering bounties. Since these bounties, however, have no relation to taxation, I have not included them in this discussion. Likewise I refrain from discussing the laws of Massachusetts and Vermont, which provide for the offering of annual prizes to encourage the planting and cultivation of trees; these prizes also have nothing to do with taxation.

The general type of forest tax legislation which has been followed by our States until very recently has failed to produce any appreciable results. Of this fact there cannot be the slightest question. It is important to determine the causes of this failure. In the first place the laws contain many technical defects. The common limitation to plantations, or even to land other than woodland, largely defeats the purpose of the laws at the outset. The regulations regarding planting, thinning, etc., are often faulty from the point of view of scientific forestry. Often the number of trees required to the acre is too large. The list of species designated is not always well chosen.

A more serious defect is the injustice to the locality where the exempted forest happens to be located. The only justification for a concession to the forest owner is the resulting advantage to the State as a whole. Yet the particular town or county where the land is located is called upon to bear the whole or the principal part of the burden of a diminished revenue. This tends, first, to lead certain assessors to try to get even by adding enough to the assessment of some other property of the timber owner to make up for the reduced taxes on his forest lands. In the second place it prevents many owners from taking advantage of the law, since they dislike to arouse the hostility of their neighbors or of the local authorities by an apparent attempt to get out of paying their share of local taxes.

Another vital reason for failure is that the actual financial consideration is not ordinarily very great after all. The exemption is limited to a fairly short period, after which land and trees are again subject to the general property tax. The abatement comes, of course, at the time when the trees are small, and the taxes would not be very heavy anyway.

Finally the whole principle on which these laws are based is, in the writer's opinion, a false one. The idea has been to give some concession, some special favor. This is not what is needed. There is no sound reason why the owner of forest lands should not pay his just share of taxation. And if forestry is going to be profitable at all, it can well afford to pay its just share. What is needed is simple justice, and nothing more. The general property tax acts as an obstacle to forestry, for reasons which cannot be entered into here. What we want is a new system, which shall avoid the evils of the general property tax by a change in method, but which shall still call upon the forest owner to bear his full share of the burden of supporting government.

Within the past two years two of our States have taken the first step, somewhat faulty and timid to be sure, toward a sound method of forest taxation. Michigan passed a law in 1911 and New York three laws in 1912. Without going into details, these laws provide for a separation of land and trees for purposes of taxation, the land either exempt entirely or assessed at a low value, and the trees taxed only when cut, and then at a certain percentage of the value of timber cut. The operation of these laws will be awaited with great interest by all those who are interested in forest tax reform.*

*For a more complete analysis of State legislation, with abstracts of all the laws in effect in October, 1908, cf. "The Taxation of Timberlands," by Fred Rogers Fairchild, Report of the National Conservation Commission, Vol. II, pp. 581-632. The abstracts of State statutes are on pp. 588-589. All of the laws there described are in force at the present time. The following legislation has been enacted since then: Connecticut, Laws of 1911, ch. 205 (a more liberal exemption law). Maine, Laws of 1909, ch. 136 (amending Laws of 1907, ch. 169, by reducing the number of trees required per acre); Laws of 1909, ch. 193 and 230 (providing for a special tax on wild forest lands, the proceeds to be used for fire protection). Massachusetts, Laws of 1909, ch. 187 (special exemption relating to land stocked with white pine seedlings). Michigan, Laws of 1911, ch. —— (referred to in text). New York, Laws of 1912, ch. 249, 363, and 444 (referred to in text). North Dakota, Laws of 1909, ch. 50 (slightly amending the previous statute).

WITH THE BILTMORE BOYS

THE Biltmore Forest School—51 students strong—is encamped at Marshfield, Oregon, fall camps of the School, during September. Here they are in the midst of the finest stands of giant Red firs, White Cedars and Sitka Spruce. The logging operations of our hosts—the C. A. Smith Timber Co.—are in keeping with the size of the trees; gigantic, ingenious, impressive. Marshfield is so situated that the students can reach the various logging camps of the company readily by a short boat ride over the many sloughs emptying into Coos Bay. A huge fibre plant is in course of construction; it is intended to utlizie the waste of a sawmill producing actually over 550,000′ b.m. per diem. The logging operations will be converted into operations by electricity. A huge electric power plant is being erected. In spite of the enormity of its holdings, the directors of the company figure on a second growth and are careful in leaving a sufficient number of seed trees on the areas logged-over. The second growth follows in the vague of the first growth with an amazing vigor; the rate of accretion exceeds 800′ b.m. per annum.

The Biltmore Forest School has traversed, en route from its summer camps near Cadillac, Michigan, to its fall camps on the Pacific Coast, the forests of the Inland Empire, spending a number of days in the Coeur d' Alene Region, and has also visited the typical operations near Seattle and near Tacoma. The gentlemen of the U. S. Forest Service and the leading lumbermen have been untiring in their efforts to make the excursions of the Biltmore Forest School instructive. It is natural that the School is in clover particularly wheresover its own graduates are the guides in the forests visited. The School sails for its German winter quarters in the early days of October.

THE PRICE OF FOREST PRODUCTS

By Frederick S. Underhill, *Phila.*

I WANT the duty on Lumber reduced," declared a Member of Congress, "that the mechanic may build his home cheaper!"

The duty on lumber was reduced by the Payne-Aldrich bill from $2.00 to $1.25, and after a year or more we find the price of lumber higher instead of lower.

What is the reason? There must be a "Lumber Trust" asserts the demagogue and the Yellow Journal. The search of the Government utterly fails to find a "Lumber Trust"; and what is more, the men who are in actual competition in the sale of the product of the saw, know that there is no man or organization of men who do or can control the price of lumber. When it comes to fixing lumber values the sole arbiter and rulers are those, intangible, yet effective, autocrats: "Supply and Demand."

At a recent Economical Conference in Philadelphia, a well known Single Taxer risked the unsupported declaration that Frederick Weyerhaueser was the Autocrat in whom was personified "The Lumber Trust" upon whose whims the price of lumber went up, up, up! When he wanted a little more money he just raised the price of his timber, and every manufacturer was thereby forced to raise the price of his lumber.

That Frederick Weyerhaueser has been far-sighted and wide-awake enough to acquire, while others were indifferent, large forests of timber, at times when they were inaccessible and therefore cheap, is an undisputed fact, and it is further true that much of it has since become accessible, marketable and valuable. The writer does not know the man, but I see no reason why in this matter he is any different from Philadelphia's great Philanthropist, Stephen Girard, who when certain large sections of Philadelphia were away from the business center of his day, was far-sighted enough to see that Philadelphia would grow and bought largely of real estate which was valued lightly at the time but which has since increased in valuation many hundred-fold.

Mr. Weyerhaueser is interested in several lumber manufacturing companies. He and his associates can fix the price on the lumber they saw, but there their price-fixing power ends. Every other lumber manufacturer and dealer fixes his own prices and sells at whatsoever prices he will without any regard to Mr. Weyerhaueser. If he wants to sell lumber in the markets where our firm sells lumber he must meet our competition!

The producer of one kind of lumber cannot afford to disregard the capacity of the producer of other kinds of lumber. Scarcity of White Pine and consequent advanced values affords an opportunity for cheaper Short Leaf Yellow Pine to secure a foothold which it never relinquishes. Scarcity of Poplar and higher prices affords an opportunity to Cypress to demonstrate its value as a substitute and once established it becomes a competitor and not a substitute. Scarcity of Oak, Walnut, Mahogany affords similar opportunities to Birch, Chestnut and Red Gum.

Well, how is it that prices are advancing? Something more effectual than legislation has caused it. You cannot legislate value into a board or plank, nor out of it!

First, in point of influence in affecting present prices, were the disastrous floods in the Mississippi Delta: destroying numerous saw-mills; wiping out logging camps and destroying equipment; washing out main and branch railroad lines and logging roads, and effectually closing down a large number of saw-mills for many months, affecting Yellow Pine, Cypress, Oak, Ash, Gum and other lumber.

At the same time, the Appalachian District and the South Atlantic Slope experienced a prolonged period of persistent rainfall, making operations in the woods difficult and at times impossible, as well as making the hauling of lumber that was sawed back in the woods impossible because of bad roads. Thus, cutting down the production of North Carolina and South Carolina Pine, Appalachian White Pine and Hardwoods.

Canadian mills are reported also to have had greater difficulty than usual in getting in their logs and thereby reducing the output of Canadian lumber.

The reduced demand for Tan-bark because of former overproduction and the Tanning industry affected also by the uses of Tannic Acid produced from substitutes for Bark, has resulted in a reduced cut of Hemlock, inasmuch as the mills cannot afford to cut Hemlock timber if there is no sale for the Bark.

On the other hand, the demand caused by increased activities in wood consuming plants, and especially by the railroads, in making extensions and in a renewed activity in car-building, has added value to the product of the Forest.

Supply and Demand establish the prices of lumber. If the supply is profuse and the demand light the prices fall low and no man or set of men can raise them; competition is mighty keen on a falling market. If the supply is curtailed and the demand is heavy the prices will advance and no legislation can change this fact, except destructive legislation aimed to destroy industries in general and to wreck commerce.

AMERICAN FORESTRY ASSOCIATION ENDORSED

AT the very successful convention of the Canadian Forestry Association in Victoria, B. C., early in September, at which the American Forestry Association was represented by E. T. Allen, of Portland, Ore., the widely known forester of the Western Forestry and Conservation Association, the following were among the resolutions passed:

"Believing that actual working co-operation between public and private forest management is essential to mutual understanding and complete success, we urge upon Canadian lumbermen the study and emulation of the lumber owners' co-operative fire associations of the Pacific Northwest, which are proving of great value not only in their own fire control but also in bringing about closer and better relations between all agencies engaged in forest preservation.

"Whereas, the proper disposal of debris resulting from lumbering operations is essential to the effective protection of forests from fire; resolved, that the association urges upon the Dominion and Provincial governments the advisability as soon as practically possible of adopting measures to this end.

"Resolved, this Canadian Forestry Association is of opinion that it is in the public interest that squatting or settlement should not be allowed on lands that are chiefly valuable for their timber, and that all non-agricultural lands should be reserved permanently for timber production.

"Recognizing our common bond and common aims, we desire to testify to the achievements and practical assistance to the forest cause of the American Forestry Association, and hope for increasing co-operation between our organizations.

"Resolved, that this convention endorses the action of the Dominion government in setting aside forest reserves; that it urges further reservation of suitable areas and the retention of existing reserves in their entirety with the object of affording to the surrounding districts the best results for all time in regard to fuel and timber supply, grazing, and the production of game and the regularity of stream flow."

PUT YOUR CAMP FIRE OUT!

For Help, In Case of Fire, Call Upon the Wardens of the

NORTHERN FOREST PROTECTIVE ASSOCIATION

MUNISING, MICHIGAN

THE NORTHERN FOREST PROTECTIVE ASSOCIATION

By President Thornton A. Green

THIS Association was really formed in February, 1911, although some preliminary work had been done for several months before that. It was organized shortly after the severe fire losses of 1910, and the idea of having a private patrol was favorably received by the owners of several million acres of land. It was thought possible to have an organization for all of Michigan and Wisconsin, but we have finally decided to limit its operations, at least as far as maintaining a patrol, to the Upper Peninsula of Michigan. Few people realize the extent of this territory. We have eleven million acres of land, nearly half of it being covered with a dense growth of virgin timber, largely hemlock, with a generous sprinkling of maple, birch, ash, cedar, spruce, pine, basswood, elm and balsam. Beech and red oak grow in limited areas. Our soil varies greatly, due to our having been visited by three glaciers in past ages and to part of the Peninsula having been covered at various times by three great lakes, Lake Algonquin, Lake Duluth and Lake Ontonagon. As usual, the glaciers left streaks of rather barren sand, which was covered with pine half a century ago, but are now desert wastes, or nearly that. A large part of the territory is very fertile, however, and the hemlock and hardwood stands are very dense. There are numerous rivers and some inland lakes. About eight per cent of the entire district is moun-

tainous. The highest mountains in the north central states are just west of Ontonagon, and the western half of the Peninsula is traversed by ranges of hills, interspersed by very fertile valleys. The railroads cover the entire territory pretty thoroughly, so that nearly all of it is easily reached. There are few locations more than fifteen miles from a railroad.

The remaining timber is owned by many interests, but there are large enough holdings to make it possible to patrol great areas of timber belonging almost entirely to our members. In spite of this we patrol a great deal of land not listed with our organization. Our entire membership embraces about two and a half million acres and we cover in addition to that about one and a half million acres, which is interspersed among the holdings of our members. The season of 1911 was favorable to our work, and except for a short period, this season has been. We use from 15 to 20 rangers whose duty it is to cover their allotted districts as often as possible. These men were picked from the woods' foremen previously employed in the districts they now patrol, as far as possible, so that they know their ground. They cover their fields in various ways; some on foot, some on horses and some on railroad velocipedes. They write daily reports to our Chief Forester, which they mail to him once a week. These reports are very complete, as shown by the following:

"Northern Forest Protective Association, Iron River District.
Iron River, Mich., June 23, 1912.
Thos. B. Wyman, Secretary-Forester, Munising, Mich.

Dear Sir: I hand you herewith full report for the week ending Saturday, June 22.

Sunday: At Bates and Sunset Lake.

Monday: Visited camping and fishing places at Hagerman Lake and vicinity.

Tuesday: On roads and amongst settlers on east half of T. 44, R. 34. Called on supervisor of Bates Township.

Wednesday: Looked after brush burning on county road work, between Iron River and Beechwood. Visited fishing places along Iron River.

Thursday: Visited campers on south side of Chicagon Lake. Called on settlers in and around Pentoga. Visited Gibb's logging camp.

Friday: Attended a meeting and picnic of Iron County Grange at Iron River.

Saturday: Visited fishing places along Morrison Creek and Paint River in T. 44, R. 35.

Yours very truly,
WM. RIGSTAD, *Warden.*

Note to Wardens:—Report daily trips; streams; railroads and roads traveled; camps, homesteads and farms visited; calls upon supervisors and other wardens; people met in the woods; fires, trespasses and general conditions found."

All fires are reported at once. Hundreds of fires are put out each season despite the smallness of our force of rangers. Our work is necessarily to a great extent educational as yet, and I presume always will be. We have placarded every road, camping ground and berry picker's hut in the country we patrol, with signs of our own and those issued by the State.

We were astonished to find that only about two per cent of the settlers in outlying districts had ever read the State fire laws. We furnished them all a copy. Our rangers have called upon every homesteader and settler in their districts, and they have conferred with county, township and village boards in regard to protective measures. Until we took up this private patrol work, few officials would aid in fighting fires. Now, they all will. No difficulty is found in getting what help is needed. The State has made all of our men deputy State fire wardens. They have also included a number of woods superintendents and foremen at our request. We have had fine support from the local newspapers and in these various ways have become quite a recognized force. Apparently the people believe

NO FOREST FIRES THIS YEAR

HELP! WILL YOU?

For Help, In Case of Fire, Call Upon the Wardens of the

NORTHERN FOREST PROTECTIVE ASSOCIATION

MUNISING, MICHIGAN

PIPES
CIGARS and CIGARETTES

ARE

DANGEROUS

A Fire From Your Pipe
Means That You, Alone, Are Responsible

BE CAREFUL!

For Help, In Case of Fire, Call Upon the Wardens of the

NORTHERN FOREST PROTECTIVE ASSOCIATION

MUNISING, MICHIGAN

IF YOU SEE A

FIRE

PUT IT OUT!

A Minute of Your Time May Save a Fortune For Your Neighbor

Big Fires are the Results of Little Ones

For Help, In Case of Fire, Call Upon the Wardens of the

NORTHERN FOREST PROTECTIVE ASSOCIATION

MUNISING, MICHIGAN

CAMPERS AND BERRY PICKERS

ll Campers are Urged to use every care with

FIRE

and to Leave the Grounds in Neat and Safe Condition.

You are interested in the safety of these lands or you would not be here—let your interest be shown!

If you are seeking a better berry plain, trout stream, bass lake or hunting site, ask the Wardens of the

NORTHERN FOREST PROTECTIVE ASSOCIATION

MUNISING, MICHIGAN

in our work and are helping us to accomplish it. Last season about eight thousand blueberry pickers were out on the marshes. In former years they have been the cause of many fires. Our rangers called on nearly all of them, and as a result we could not trace a single fire to that source. We have the hearty support of the lumber companies, railroads and settlers. We expect to keep hammering away in the hope, which I believe will be realized, that people will learn to be careful and avoid starting fires. We have done nothing towards putting in phone lines and watch towers, but have done considerable in the way of clearing up old logging roads or getting the township officials to do it, as these roads make good fire lines.

We have hopes of being able to increase our force considerably another year. There is a good chance of our acreage growing to four million acres soon. We spent five-eighths of a cent an acre in 1911, and will spend just about that amount this season, and I believe our work will be more effective each year.

Through our efforts, largely, an organization similar to ours has been formed in Lower Michigan. So far we have failed to sufficiently interest the Wisconsin timber owners. Their holdings are now badly scattered and their problem is more difficult than ours. Nevertheless, they should do something along the lines we have been operating on. We will, in the course of time, carry our educational work into our State legislature with the idea of bettering our laws and eventually getting some sort of State patrol. At present we get no support from the State. Our Association is patrolling State lands now and receive nothing for it. We think we have accomplished enough to justify our expenditure of both time and labor, and will continue to use both for the preservation of our timber resources.

THE FIRE BUG AND THE EAST WIND

E. T. Allen

"No, I'll not burn my slash this spring,"
The moss-back logger said,
"I'll trust to God and luck again;
Expense is what I dread."

"It's time to hit the trail again,"
The careless camper said,
And left his little fire ablaze;
Within its leafy bed.

"I'll light another cigarette,"
The idle loafer said,
And chucked his old snipe in the brush
One end still glowing red.

"Let's punch the screen out of the stack."
The donkey fireman said,
And so he did and all the sparks
Sailed blithely overhead.

"Come on, we'll dump our ashes now,"
The railroad trainmen said.
The train soon fanned them far and wide
As on its way it sped.

"Good time to fire my slashing now,"
The thrifty rancher said,
And touched it off without a thought
Of how far it might spread.

"I think I'll blow an hour or two,"
The restless east wind said,
Then liked it so he changed his mind
And blew a week instead.

"Millions in lives and timber lost,"
The newspapers next said.
What made those fires all start at once,
We wondered as we read.

"It wasn't us, it was that wind,"
The fools in chorus said.
So they're alive and loose this year
——We hope the wind is dead.

TWO SOLUTIONS OF THE FORESTRY TAX PROBLEM

By Arthur Goadby

ONE of the most urgent needs of our growing conservation policy is a scientific method of forest taxation. At present the manner of assessment of private timber lands is unjust and arbitrary and permits the annual re-taxation of all the previous annual increment, thereby driving landowners to hasty and wasteful lumbering as well as discouraging them from any replanting whatsoever.

These facts have led several of the States in recent years to attempt some sort of remedy either by exempting forested lands or by regulating the assessment thereof. But hitherto such experiments have met with small success largely because of their inadequacy, and largely because any legislation of this sort is exceedingly difficult to frame and still more difficult to enact, since many divergent interests are involved and in one or two instances well devised measures have been nullified by limitations in the State Constitutions.

Something, however, must be done and immediately, for public welfare depends primarily upon the forests. We have but to refer to such practical considerations as erosion, the washing of fertile soil from hillsides and slopes where it is of permanent value into river beds and harbors where it becomes a costly nuisance; to disastrous floods due to unrestrained torrents; to extreme climatic disturbances whereby sudden frosts and heat waves are carried far out of their normal zones, and whereby drought succeeds drought; and to the increasing scarcity and high cost of timber. Then we have but to refer to the great hygienic value of forests, for since prehistoric ages they have been nurseries of vigor; and to such aesthetic considerations as unsightly landscapes and barren mountain slopes, muddy rivers, streams dried up or littered with débris, and the thousand and one unpicturesque details which send thousands of people and millions of money abroad to Europe every year to satisfy the craving for beauty. And then again we must refer to another practical detail, that our wastefulness is compelling us to buy at high prices from abroad the timber which Nature would bestow on us almost for nothing at home.

So vital are these matters to the Nation at large that scientific reforestation may well be said to be the most important and immediate question before us. Every effort should be made at once to secure a forest cover of at least one-fourth our total land area, a proportion now regarded as essential to every civilized community, and one actually existing this day in Germany. But since four-fifths of all the land in our country is in private hands it is obviously impossible, as well as unnecessary, to achieve this end except by encouraging forestry in some way on private lands, and it is also obvious that either the owners of these lands must be induced to engage in forestry or the different States must undertake to reforest these private lands themselves.

Today it is a question which method is the better, private or public enterprise. We are in an age of experiment and perhaps the better solution would be the latter, but certainly we should try both.

In either case it seems to me there are several cardinal principles that should be embodied in the law of every State, even though some amendment will need to be made first to their respective State Constitutions, namely:

1. Since immature standing trees have no financial value they should be exempted absolutely from taxation wherever existing, and

2. All private land in the State should be assessed at a value reckoned without reference to any immature

timber standing thereon, and the annual taxes should be collected therefrom, except that in the case that a private landowner shall request certain privileges under the law, and shall agree to certain conditions, hereinafter stated, taxes payable on his land shall be deferred until harvest provided his land shall bear a standard quality and density of immature trees. And all trees mature or immature that are harvested from such standardized lands should be liable for the total amount of all the accrued back taxes and their proceeds should go toward discharging this liability together with a harvest tax of 2 per cent on the stumpage value, before they be removed from the ground; provided, however,

4. That the district land revenues be not seriously impaired during the first general deferment period, before the general harvest reimbursements begin, and provided,

5. That land, timbered and not timbered, sufficiently valuable to tempt to tax evasion or to speculation, be denied deferment.

6. Which contingencies (4th and 5th) can be amply provided against by the following restrictions:

7. Let the State deny deferment to land situated within sixteen miles of a city of the first class, within eight miles of a city of the second class, within four miles of a town of the third class, and within two miles of a town of the fourth class, but let the State at first grant deferment to lands valued (irrespective of timber) at the average value of farm land throughout the State; and every year thereafter admit to entry land worth two dollars more (irrespective of timber) than the eligible land of the previous year, until

8. The eligibility be extended to land of such high value as (a) to begin (in the opinion of the Legislature and Governor) to tempt to speculation or evasion, or (b) until further deferments would far exceed harvest reimbursements, or (c) until the wooded area should exceed one-fourth of the total area of the State. Moreover,

9. No landowner should be entitled to enter for deferment less than one acre or more than 1,000 acres in any one year, and

10. The number of trees required to secure the land deferment should be approximately not less than 700 newly planted trees, or approximately 350 newly planted and 350 old trees, to the acre.

11. The State should require its agents to inspect all plantations before granting the deferment, and

12. Owners should be required to give to the local assessors thirty days' notice in writing of any intention to cut all or part of the crop. The assessment should then be made upon the stumpage value of the proposed cutting, and the owner should pay the local collector before cutting the timber all the accrued land taxes together with the harvest tax of 2 per cent.

13. Failure to give such notice should bear a penalty, and the proper official should bring action to recover the amount of said penalty.

14. The State Tax Commission should be required to calculate the average value of farm lands throughout the State and report the same as a basis for legislation.

15. In case that any difficulty might arise to render inexpedient the deferring of taxes, a tax of $.002 on every dollar of the whole land value of the plantation should be laid against the harvest, in addition to the harvest tax of 2 per cent on the total stumpage value of said harvest or harvests, such value might at present in New York (1912), be estimated at $20.00 an acre.

The manner of fixing this rate of .002 on every dollar of the farm value is found as follows: Land worth $1.00 an acre pays, at the rate of $.0015, in fifty years the sum of $.075, which is .0015 per cent of the gross receipts estimated as $500.00. But land doubles in value in fifty years, hence the average rate would be about $.002 on every dollar's worth of the total assessed valuation of the farm at time of maturity.

Now, while the enactment of these measures would undoubtedly encourage private forestry, it is possible that actual experience would show that few people might avail themselves of them. A

timber crop is more or less of a hazard and perhaps few would be greatly attracted by remote profits especially when interest, fire insurance, maintenance and taxes are sure to bring the ultimate cost to ten times the original investment, not reckoning meanwhile the loss of income from the property.

Forestry even under such equable taxation might be too great a luxury.

It is then probable that the State will find it necessary to enter upon a more aggressive policy and perhaps after all the only solution of the problem will be found to lie in a system of State loans and management. Extensive forests, like liberal educations, pay the highest dividends in the world. They save expenses besides creating revenues and certainly it is much wiser to expend one dollar to hold soil on the hills than to expend $5 in putting it back again.

If, then, the State shall deem it wiser to at once begin a more speedy and effective policy it seems to the writer that some system like the following would be found constitutional and practical.

(1) Let the State first enact that all standing immature timber shall be exempted absolutely and forever from taxation, and,

(2) That all lands shall be assessed at a value reckoned without reference to any immature timber standng thereon.

(3) Then let let the State either by annual apprograions or by an issue of 4 per cent 30-year bonds raise a special Forestry Fund, the proceeds of which are to be employed as follows:

(4) The State shall advertise for offers of land in blocks of 10 to 100 acres, and shall accept always the land having the lowest average assessment value, preferably on steep hill slopes.

(5) That it shall agree to pay to the owners an annual rental of 2 1-2 per cent of the assessed value of the land (irrespective of the timber thereon).

(6) It shall plant this land immediately with seedlings of standard density and quality.

(7) It shall pay annually to the local tax district the tax levied on the land irrespective of the timber.

(8) It shall pay all fire insurance and maintenance charges.

(9) The sum total of all moneys expended upon each plantation, including all rentals, costs of plantation, including trees, seedlings and labor, local land taxes, fire insurance and maintenance charges, shall be reckoned up at the time of the various harvests, and such total multiplied by 1.025 (which is an average of 1.05 per cent), shall constitute a preferred claim upon the estate, and said claim, together with a harvest tax of 5 per cent on the stumpage value of the harvest, shall be discharged out of the various harvests, and the remainder of the proceeds of said harvests are to be the property of the owner.

(10) All mature growth to be harvested except where the Forest Commission should require the strategic protection against erosion and flood, and such excepted lands should be bought by condemnation at the price they would bring if cleared in the open market and the timber thereon bought from the owner at the prevailing stumpage value.

(11) One-half of one per cent of all lands so leased by the State shall be kept available as public camp sites and recreation grounds under restrictions set by the Forestry Department.

(12) This forward policy shall continue until one-fourth of the State area is under forest cover.

(13) All proceeds of the harvest taxes collected by the State shall be applied (first) to a sinking fund to pay interest and capital on the original issue, if any, of Forestry Bonds; (second) to buy the forests and land on the strategic hill slopes; (third) to improve fire-prevention service; (fourth) to destroy insect and fungus blights; (fifth) to encourage bird life, to planting trees and bushes along streams and highways, to prosecute timber thieves and firebugs, to improve water-ways, to buy lands in the suburbs for parks, to creating forest recreation grounds, to improve landscapes, to beautifying the

country under the supervision of the Forestry Department.

Are we too optimistic about the value of these polices to the State? A simple calculation, for instance, will show that in New York alone there are 4,000,000 acres available for forestry which could be made to yield an average income of $3.00 a year. The annual harvest tax of 5 per cent therefore would yield the State an income of half a million dollars, which would be a magnificent sum to expend as I have outlined, to the vast advantage of all concerned, for Nature is willing to shower its wealth upon us if we will only give it a chance.

THE SOCIAL SIDE OF LUMBER LIFE

By P. F. Cook

Assistant Editor St. Louis Lumberman

DURING the earlier period of American industrial history there was little opportunity for the play of the social graces of character in the industrial life of the average community. There was so much work to be done of a pioneer nature that the chances for social indulgences were few and far between. As a result of this there was evident on almost every side a certain bigotry and lack of breadth in the ordinary affairs of business. Business men in the conduct of their every-day affairs were as hard-headed and unsociable as men could very well be. Some of the uncouthness that is the invariable accompaniment of an undeveloped state of civilization was manifest in almost every phase of business activity. The result was that business lacked that warmth and geniality and the sense of brotherhood which evidently is becoming more and more prominent in the industrial life of the present time.

It was only natural that as progress made enlightenment possible and the barriers which separated men were broken down, that prejudice, bigotry, and the unworthy hatreds one business man felt for another should gradually disappear. Railroads, telegraphs, telephones, newspapers and the new gospel of universal brotherhood have pretty effectually shattered the old hard-headed, unforgiving and barbaric ideals of even thirty years ago, and in its stead today we have more kindly feeling and broader ideals of the relationships between one man and another and a readiness to be of assistance in helping out a comrade in business.

This change is nowhere more evident than in the lumber business; in fact, it is doubtful if there is any line of industry in which there is so much sociability between those engaged in its various branches, as in the lumber industry. The organization of all the different branches of this business during the past twenty years is largely responsible for the change. Men who hitherto were strangers to each other now know each other well. Following the old scriptural maxim, "Come, let us reason together," men in every branch of the lumber industry have formed clubs and associations, city, district, state and national, until there is hardly a man engaged in one division of the business in any section of the country who is not more or less familiar with his fellow working in the same line in any other section of the country.

The lumber trade newspaper has been a factor in bringing this condition about. Publishing all of the news of the associations, acquainting their readers with so much of the personal and social life of the trade, they have served to open

up the minds of men engaged in the lumber business everywhere, helping in this way to make things pleasant for everybody and enabling their readers to become more familiar with the personal characteristics and business traits of the laborers in the various phases of the industry.

Next to the newspaper one of the influences that has counted for much has been the lumbermen's clubs, which are to be found in nearly all the principal centers of the industry. These organizations meet at least once a month and their deliberations are opened with a fine dinner in one of the club houses or hotels. One or two speakers upon vital topics are provided for and the repast is usually sweetened or rendered more delightful by a charming musical program by some leading orchestra of the town. The speeches are usually followed by a general discussion, all of which enables men to become better acquainted with each other's point of view and to learn to form new estimates and revise their opinions of men with whom they have been altogether insufficiently acquainted in times past. In the past two decades lumbermen have been cultivating the social side of their lives more and more, and during this period there sprang up what is known as the Concatenated Order of Hoo-Hoo, a fraternal body without an imitation or a parallel anywhere in the world. The purpose of this organization was to break the monotony of convention proceedings. These concatenations are of an unconventional character and the festivities which it fostered as a means of imparting new zest to the life of its members were quite unique in their character. Thousands and thousands of men all over the United States as well as across the water have worn the emblem of this order for a good many years past, and it is still a factor in the promotion of joyousness of spirit among those engaged in the lumber industry and related lines.

Readers of the lumber trade journals of the country will find nothing new perhaps in what the writer has stated above. It is so familiar to them that it has really become trite, but in this brief space sufficient has been said to make it plain that the social side of lumber life has been very largely and successfully cultivated during the past twenty years, and that the spirit of comradery and the larger view which today obtains on all public questions among the men engaged in this great industry is largely due to the broad-gauged spirit in which the social side of their natures has been given fuller play during the period under consideration.

Man is essentially a sociable being. He is not a mere human cash register, and he develops best and appears at his best when all the god-like attributes of his character are given a chance to grow and an opportunity to display themselves in all their freshness and simplicity. To realize the truth of this nothing could be more convincing than to see some of the men whose names are foremost in the lumber business at one of the social sessions of Hoo-Hoo or at one of the many dinners or monthly banquets given in one of the leading cities by the Lumbermen's Club. A boy let loose from school is never happier than some of these captains of industry when free from the cares of business and given a chance to show what they really are man to man across the social board; in fact, it is no exaggeration to say that only those who frequent these affairs of associations and clubs really know the lumbermen at their best, and it is certainly a delightful experience to find that the man whom you thought was simply a relentless pursuer of the almighty dollar is also, in many instances, a genuine good fellow, filled with the milk of human kindness, touched by the pathos of human life in its everyday happenings, and responsive to what is poetical and emotional in all that concerns the affairs of the man with whom his interests in life are so intimately identified.

The social side of lumber life in the United States has certainly reached a degree of perfection that makes it well worth the imitation of those engaged in other lines who have not as yet felt the uplift and the sense of kindliness that comes from a closer contact and an intimate knowledge of those engaged in similar lines or occupations.

LONG-BELL EXPERIMENTAL FARM

SUBMITTED BY VICE PRES. C. B. SWEET

ONE of the most effective agencies in the development, not only of Calcasieu parish, but of the State of Louisiana and of the entire South is the Long-Bell Experiment Farm, extending north along the Kansas City Southern Railroad from the mill town of Bon Ami almost to the corporate limits of DeRidder. Translated into English, "Bon Ami" means "Good Friend." The work done on this farm and the results already achieved prove that the Long-Bell farm is one of the best of friends, not only to owners of cut-over timberland and the communities to which they are adjacent, but to thousands of people who are destined to found happy and prosperous homes on land until recently looked upon as unproductive, and valueless.

The work of the Long-Bell Experiment Farm is by no means completed, although in seven years it has become an investment rather than an experiment; but it has already established the value of cut-over pine lands for the growing of fruit and vegetables. It has shown that vegetables of all descriptions can be produced in the open air weeks before they have matured in the populous section of the country and can be transported and sold at a fine profit. It has not only established that fruit growing is profitable, but by a series of plantings conducted with infinite care and watched with unwearied vigilance has established the fact that some species of fruit are sure profit makers and some are not profitable, and is still weighing others in the balance. Not only have all kinds of fruit been planted, but every variety of each particular fruit that promises any results, so that its records constitute an invaluable text-book for the farming of cut-over lands.

A feature of the utmost importance is that a cost system is in use on the farm that is rigidly applied to every product on it. For instance, three men put two days labor each in cutting back the fig trees; that four others worked five and one-half days each on setting out orange trees; that two spent the week hauling fertilizer, and that two others worked spreading it where needed on the farm. The superintendent's record takes note of all this. The time spent by each man, and what he did, are charged up in the daily record. Every item of cost is charged to its proper account. Every dollar spent and every day's labor performed in the Elberta peaches is charged against the Elberta peaches. When they are gathered in the summer, the cost of gathering and packing, hauling and transporting is charged against them, and they are duly credited when the money received from their sale comes in. By this method the superintendent knows not only how much profit the crop yielded, but the average profit per tree. Unhealthy or unproductive trees are left out. They are on the "hospital list."

So it is with all other crops. The fig trees have an additional link in the accounting system. Their crop is sold to the big preserving plant on the farm. When the figs are gathered, the fig account is given a credit of three cents a pound. This is charged to the preserving plant account, together with the cost of sugar, steam, containers, labels, packing and labor. Then when the product is marketed, the preserving plant gets its credit.

This strict system of accounting is indispensable, if the Experiment Farm is to be of the highest value to the future farmer of pine lands. It is not enough to know that the land will produce crops. The vital thing is to know what it will produce that can be marketed at a profit and how much average

profit may be expected. It is this kind of definite practical information that will eventually transform these thousands of acres of blackened stumps and tree tops into profitable farms and orchards.

WHY THE EXPERIMENT FARM WAS NEEDED.

To know what made necessary all this work of experimenting and figuring, this planting and re-planting of the same ground with different species and varieties of fruit trees and shrubs, one must know the present day conditions as well as those who come into actual contact with them.

Over fifty years ago, the denuding of the land covered with vast pine forests began at Lake Charles when Capt. Goos' steam sawmill, the first in this section of Louisiana, began to eat its way into the yellow pine belt. For years, sawing was on such a small scale that little impression was made upon the tree-covered area. Thirty years ago, sawmills of greater capacity were put into commission, logs being floated to the pioneer mills by means of the numerous streams.

Then came the building of railroads into the pine forests, and the extension of transportation facilities. The number of mills multiplied and their capacity for sawing was greatly increased. When the Long-Bell Lumber Company began to acquire timberlands in Calcasieu and its subsidiary organizations began to erect milling plants, the pine forests were disappearing at the rate of upwards of a hundred acres a day. At the present time fifty sawmilling plants are in operation in Calcasieu parish and ninety thousand acres a year are being turned into stump land.

Roughly speaking, eighty per cent of Calcasieu's surface was originally wooded. Nearly half of the standing pine timber has been cut since the first mill was started. About 700,000 acres of its area is classed as "denuded pine land." Up to ten years ago, everybody agreed that no one could raise crops on denuded pine land. It might pasture a few sheep, they admitted, and raise a patch of corn or cotton, here and there, but anything like making it all farm lands was out of the question. Even the millmen, the owners of the land themselves, concurred in this opinion. They would have sold their denuded lands for a song, but nobody wanted to sing. Some of them even talked of surrendering their denuded lands to the State rather than pay the few cents per acre annually demanded as taxes.

This was a gloomy outlook for the hundreds of people who came to work in the mills, hoping to find a permanent home here, and for the busy, energetic, little communities that had sprung up around these centers of activity. Luckily the Long-Bell Lumber Company never accepts say-so and theoretical evidence as final. It was not willing to admit that this land was designed by Providence to grow pine trees and nothing else. So, after its milling plants had been set to work, it sent over to Texas for T. S. Granberry, a practical horticulturist and agriculturist, who came originally from Georgia, and virtually said to him, though not in those words:

"You see before you, stretching from Bon Ami nearly to DeRidder, approximately 460 acres of land, covered with stumps and tree tops and fallen logs. People around here say that it cannot be put into shape for fruit and vegetables and other crops, and that if it could be cleared it wouldn't raise anything, anyhow. We don't believe it. Go ahead and see what you can do with it and call upon us for the money."

That was six years ago. To give some idea of what Mr. Granberry has achieved is the purpose of this article; but it may be said in advance that there has been no more talk in Calcasieu of turning denuded pine land back to the State for taxes. All the return the Long-Bell Lumber Co. has had so far from its expenditure on the Experiment farm has been the sale of its products. It has not sold any of the denuded pine land, because the company was determined first to demonstrate to its own satisfaction the agricultural value of such lands. Then it will go after in-

dustrious, practical farmers who will come here to be permanent residents.

When Mr. Granberry tackled his piece of stump land, he began in the southeast corner, just beyond the north line of houses in Bon Ami, and worked northward. His first trees were planted there in 1907. These trees are Elberta peaches, now five years old and bearing.

Each year, some new portion of the tract has been set out, but not all of it for trees or vegetables. Part of it is used for forage crops, being unsuited to the growth of fruit. Mr. Granberry has found peanuts profitable, both for forage and for enrichment of the soil. As far as practicable, the ground is kept busy all the time. If trees of a certain species or variety are set out and do not seen to thrive they are removed and a different species or variety substituted.

"I use fertilizer, generally speaking, while the trees are young," said Mr. Granberry, when the farm was recently visited, "and plant the ground between the tree rows with some sort of crop. This fertilizer helps these crops, and at the same time the trees get their share. After they are well started, the trees do not need any fertilizer. In fact, some of them never get any of any sort. For instance, these plum trees, the Japan Wonder, have never received any artificial aid."

The trees to which he referred were a mass of white blossoms, and the ground beneath them looked as though it was lightly sprinkled with snow. "This plum," he said, "is a splendid plum for shipping. It does not fall from the tree, when it is near ripe, at every breath of wind. Now those over there," he continued, "are the Gonzales plum. It has a fine flavor and is a prolific bearer, but falls easily from the limb. It takes a good, stout tug to pull a Japan Wonder from its parent stem, even when it is fully ripe. Insect enemies do not trouble it."

Between the two varieties of plums was a strip about 60 feet wide, with rows of small shoots at regular intervals. "Duncan grape fruit, budded on trifoliata," explained the superintendent. "I tried them once before, but the shoots, which came from Florida, arrived in bad condition, and did not do well. I am going to give them another trial. That piece of ground beyond is idle now. I am going to put it in strawberries next year, and will try the effect of tile drainage on them. No, I am not an especial advocate of tile drainage, but we give everything a fair trial. That is what we are here for."

FRUIT TREES EVERYWHERE.

From Supt. Granberry's comfortable home, nearly midway between Bon Ami and DeRidder, one can get a bird's eye view of the whole farm and obtain an idea of what a transformation has been wrought in less than six years upon this one-time stretch of stumps and half decayed tree limbs. Row upon row of fruit tres, of different species and varieties stretch on either side and in front, standing as straight and regularly spaced as soldiers on parade. The fig trees are planted 15 feet apart and there are 193 trees to the acre. The peaches are 20 feet apart and run 108 to the acre.

With the peaches are planted paper shell pecan trees. Every third row north and south and every other row east and west is made up of the precious nut. When the peach trees have lived beyond the age of usefulness the pecan trees will be just coming into bearing, and the peach orchard will become a beautiful pecan grove, with the trees 30 feet apart one way, and 45 feet the other.

Among the attractions of the Experiment farm is a grove of Satsuma oranges on trifoliata stock. Approximately 250 Satsuma trees are bearing, being four to five years old, and 2,000 more are a year old. "The trees are in fine condition and came through the hard winter without injury," said Mr. Granberry. "They are free of disease and I see no reason why cut-over land will not grow oranges as well as figs and peaches." There are also a goodly array of Kiefer pears, four years old and budding out well. In fact, all the trees are so heavily laden with buds that Mr. Granberry expects a strenuous

task trimming them out when the fruit is set, so that the branches will not break.

North of the house are long rows of grapes. To be exact there are thirty rows of fifty vines each, and ten different varieties. There are three rows of each variety, planted in the order that they ripen. There are ripe grapes on the Experiment farm from June 20 to September 10. The vines, which are trained up on wire stretched on a T-shaped trellis, are four years old this year. Last year the weather was unfavorable to grapes, but the year before, when the vines were two years old, ten thousand pounds of grapes were gathered and sold.

"There is no reason why this land should not produce paying crops of grapes," said Mr. Granberry. "We have experimented with many varieties and these represent our final selections. They all resemble the muscadine type, which seems to be natural to this soil and climate. I would advise the planting of the thick skinned grape, rather than the thin skinned California varieties, which do not seem to do so well."

Just west of the grapes are long rows of fig cuttings. They number 33,000, and were all put out this spring, and, Mr. Granberry said, would begin to bear this fall.

THE PRESERVING PLANT.

The pride of the Experiment farm now is its preserving plant, where figs are prepared for the market and whence they go by the carload to Kansas City, Chicago, New York, Baltimore, Philadelphia—in fact, to every large market, although most of them are marketed by the company's own Chicago agency.

In his experiments with the fig, Mr. Granberry found no variety suitable for marketing fresh, as the fruit will not stand long-distance transportation. So he sought the fig that would best answer for preserving purposes, and finally settled on the Magnolia fig, on account of its attractive natural color as well as it bearing qualities.

The farm now has 8,000 fig trees four years old, and many others coming on. A preserving plant was therefore a necessity, and it was constructed in the Long-Bell style. The building is commodious and comfortable. The preserving plant is equipped with six steam jacketed copper kettles, each of seventy gallons capacity. After being denuded of their stems and carefully washed, the figs are taken by a conveyor into the kettles and there boiled by steam in a 34 degree syrup made of granulated sugar for four and a half hours.

Only pure granulated sugar and water are used in the preserving process, and no bleaching or coloring matter is used. The figs, still retaining their natural color, are then put up in glass jars of four, ten and sixteen ounce capacity each, labeled. The utmost pains are taken to insure sanitary handling and the fruit is not touched by hands after it receives its preliminary bath.

The four ounce jars are put up for the railroad dining car service mostly, and are individual jars. The 10 and 16 ounce sizes are generally retailed in stores. Any fruit that becomes mashed or marred in cooking is packed and sold as second quality. Last season, an inquiry for 4,800 gallons was made for the fruit, but so much of the output was already contracted for that only 2,000 could be supplied.

"The demand for our fig is always sufficient to clean up our supply," Mr. Granberry said; "so far, we have preserved figs only, but if the peach crop is good, we may add peaches to our list this year. We would have put up some last year, but the peach crop was short and our fruit brought two dollars a crate, which is a better price than they would have brought preserved."

"Mr. Granberry, what, in your opinion, is the most profitable fruit for the ordinary grower on a small scale to raise?" he was asked.

"Figs, undoubtedly," was the reply. "Figs are practically without insect enemies; they grow with the minimum amount of care and attention and begin to bear from the first year, and the preserved fruit has a large market which can hardly be oversupplied.

"I can furnish a concrete example

of their profitable qualities. The preserving plant pays our fig orchards three cents a pound for figs and the trees pay an average profit of $27 an acre. On this basis, the preserving plant pays for the figs and all expenses and makes an annual profit of $1,500 to $2,000 a year.

RUN JUST LIKE AN ORDINARY FARM.

This story would not be complete without reference to the modern farm equipment of the experiment farm. Mr. Granberry's comfortable home is flanked on each side at convenient distances with homes for the employes. There is a big packing shed, in upper part of which crates and other packing equipment is stored; a big, commodious barn for the horses and mules and their forage, besides storage room for the fertilizer, of which on an average a carload a year is used. There is a big water tank which is kept full by a gasoline engine and pumping outfit and an office for Supt. Granberry, where he keeps his records and shakes his head over such trees as refuse to earn their living. He also has telephone connection with the mill office at Bon Ami, and the messages are delivered and received over an ordinary barb wire fence.

Mr. Granberry has so much faith in the future of the cut-over lands that he is improving a fruit farm of his own, carved out of the stump land, a mile east of Bon Ami. Another strand of the same barb wire fence is reserved for a private line to his own farm.

It is also proper to state that no "fancy farming" is indulged in at the Experiment farm. Things are not raised under glass or canvas, nor watered by perforated iron pipes. Every thing is out in the open, subject to the same exigencies of wind and weather, of frost and heat, of drouth and flood that the ordinary farmer would encounter. Its purpose is to show what can be done on the land by any plain, common-sense farmer, with ordinary careful methods, and the result shows for itself. The Experiment farm is an Experiment no longer. It is an Investment.

The number of hands employed on the Experiment farm practically all the year round, averages from 12 to 14. Besides these, extra help is used in the preserving plant.

Perhaps this looks like considerable help to handle 460 acres of land, not all of which is in cultivation. It will not look so big, and it will be readily seen that none of them have much loafing time, when one considers that here are 82,716 trees on the place, trying to account to Mr. Granberry for their existence.

The big orchard is the biggest. It contains approximately 8,000 trees four years old, 7,000 trees one year old, besides 33,000 cuttings just making a start in life—all of them Magnolias.

In peaches, the Elberta easily leads, with 6,284 trees on the working list. The Belle of Georgia, an earlier peach, which finishes its year's work just when the Elberta ripens, has 1,764 members in the colony. Many other varieties were tried, but these two won out in the final contests.

The Gonzales leads the plum family with 4,000 trees and the others nowhere —that is, comparatively nowhere. The Japan Wonder is a strong probationer and the Abundance so-so.

The Satsuma orange has 246 self-supporting trees, four and five years old; 2,000 trees a year old, and 60,000 seeds to be budded; potential but not counting in the census.

The paper shell pecans will not be earning their way for some time and will be deeply in debt by the time they do; but the 2,283 trees of this kind will soon pay the debt when they get started. There are 150 Kiefer pear trees which promise well but are looked on with deep distrust because of their liability to blight; and herds of others, few in number, but many in variety, just getting a chance to prove their trustworthiness.

A new experiment in the way of disclosing the possibilities of the cut-over pine lands is being conducted by the Long-Bell Lumber Co. on a tract of 5,000 acres adjacent to Bon Ami, which have been enclosed with a hog and sheep tight fence to be used as

a cattle ranch. The advantages of the denuded pine lands for raising sheep have been amply demonstrated by the farmers of north Calcasieu, who have been raising sheep on this class of land for years with much profit to themselves. Indeed, so assured are the profits in this business, that the company has already had a chance to sell this enclosed land for a sheep ranch.

The Long-Bell Company, however, could not be induced to forego, or even delay, its cattle ranch demonstration. It desires not only to show how well adapted the cut-over lands are to stock raising, but also to show the advantages to be gained by securing better breeds of cattle. To this end 600 head of native cattle have been placed on the ranch, together with three carloads of thoroughbred graded cattle, mostly Devonshires and Shorthorns. The cattle came through the winter in good shape and there is every prospect that the demonstration will be a success.

The company this year is planting a small acreage of forage crops, and will build three large silos on the ranch this summer to provide feed for its stock.

CATTLE TICK BURNING HURTS FORESTS

THE desire of Missouri farmers to get rid of the cattle tick has caused thousands of dollars in loss of pine-timbered sections of the State. This has been discovered by Prof. J. A. Ferguson, head of the Missouri School of Forestry.

This loss to Missouri pine forests, according to Prof. Ferguson, is due to the fires set to underbrush to kill the ticks. The fires got the ticks to a certain degree, but also got all seedlings from the pine trees which were ready to begin new forests to replace those felled by the modern timberman. In regard to this discovery, Prof. Ferguson says:

"We are studying the effect of fire on the forest, especially on the younger stand and saplings. Fires run through every year. They are set by farmers to keep down the underbrush, to kill ticks and to extend the grazing area. These fires have destroyed seedlings and have prevented the Missouri pine from reproducing.

"After the ground has been covered with seedlings, trees have come up from the last seed crop, but these have been and will be burned up during the winter when the farmers fight the underbrush and cattle tick. Had the Missouri forests been protected from fire, pine would be growing on every hill in the pine regions. The State would be thousands of dollars wealthier in timbered lands had the protection started many years ago.

"As it is, with the cutting of the pine and the leaving no seed trees, the pine forests of the State will cease to exist, and the ground will become more than ever covered by oaks usually of little value.

"I'm teaching the boys the methods for fighting fires and the best way to keep the people from being careless with fire in the timbered sections. So far, however, I have found no traces or records of raging forest fires, but the underbrush fires have curtailed Missouri's pine forest wealth an inestimable number of dollars."

REFORESTING CUT-OVER PINELANDS

IN replying to an inquiry from S. G. Stoney, president of the Agricultural Society of South Carolina, regarding the reforestation of cut-over pine lands in that State, Assistant Forester W. R. Greeley of the Forest Service has expressed the following opinion:

"Generally speaking, after the merchantable timber has been removed from lands within the coastal pine belt of South Carolina and adjacent States, the only practicable measure to secure their reforestation is to protect the cut-over areas from fire. Under ordinary conditions such lands will restock themselves with a growth of pine if fires can be kept out. More than this is ordinarily not practicable for the owner.

"Good forestry should begin before such areas are cut. From investigations made by the Forest Service on a number of tracts in the southern pineries it appears practicable to adopt more conservative methods of cutting than are commonly practiced. The aim of this should be to restrict the trees removed to those which are mature, leaving on the ground the younger, thriftier trees which are still making a fair rate of growth. Ordinarily this would mean probably the leaving of a quarter or a third of the merchantable stand per acre which is usually removed. The trees so left would of course be those of the smaller size and particularly of shorter clear length and containing the most limbs and knots. Obviously they are the trees which yield inferior grades of lumber. By leaving such trees standing and restricting the cut to the older growth which contains the best quality of lumber, it is my judgment that operators would often find the results beneficial from a business and manufacturing standpoint. The trees so left would insure a thorough restocking of the ground which, together with the exclusion of fires, would result in complete restocking of the land.

"If you have any considerable acreage still uncut I suggest that you consider the practicability of adopting measures of this character. Unfortunately the Forest Service is no longer able, on account of the demands of its other work, to make examinations of extensive private holdings and give the owners specific advice on their management. I enclose, however, a list of consulting foresters who are prepared to do just such work and to give the owner or operator specific recommendations on how his land should be managed with reference both to practical lumbering operations and insuring a second growth of timber.

"For the lands which you have previously cut over, however, I have just one suggestion, namely, that fires be rigidly excluded. The custom prevalent in many parts of the South of burning over pine lands annually to secure a heavier growth of forage is usually fatal to any forest reproduction. Such fires do not kill the larger trees and often may not seriously injure saplings 15 inches in diameter or upwards. They inevitably, however, prevent the starting of seedlings and hence keep the land from producing nearly as dense a growth of timber as it naturally would if fires can be eliminated.

"Aside from protection from fire, the only possible step would be reforestation by artificial methods. This is practicable as a matter of investment in certain localities, but not everywhere. The Forest Service hesitates to recommend it as a general practice because the market values of timber are not yet in the main sufficiently high to meet the cost of planting and caring for the young trees until they reach merchantable size. Our investigations have shown that in the case of loblolly pine, which makes exceptionally rapid growth, a good merchantable crop paying reasonably fair returns upon the investment may be secured in 40 years. With long-

leaf and shortleaf pines, however, having slower growth, planting from a commercial standpoint is hardly yet feasible. The Forest Service is now experimenting with the possibility of introducing maritime pine, the naval stores pine of the Mediterranean countries, which makes rapid growth and produces an excellent quality of rosin and turpentine, on cut-over pine lands in the Southeast. This work, however, is still in an experimental stage and its possibilities are not yet fully known."

LUMBERING IN RUSSIA

By Consul W. F. Doty, Riga

LUMBERING is one of the principal industries of the Riga consular district and provides employment in the forests through the winter months for a large proportion of the agricultural population of these provinces.

The region from which the lumber is obtained comprises a forest area of 53,473,732 acres, situated in 14 Provinces and yielding timber for the most part of medium-sized red and white pine. Other varieties available but of less importance to the trade are birch, alder, and aspen. Of these forests 9,374,310 acres are State owned, 36,891,245 acres are manorial woods, 2,730,113 acres are Crown lands, and the remaining 4,478,064 acres are peasant and other tracts.

The value of forest lands in this district depends upon several conditions, the two main being locality and the amount of timber obtainable for export purposes. An average price per acre can not be given, as in addition to the timber suitable for the export trade, which mainly influences the price, there is often a considerable quantity of inferior stuff available for local consumption in the shape of firewood, shingles, etc. For a forest lying near the River Dvina the value per dessiatine may range from 100 rubles for ordinary growth to 300 rubles for special growth ($19.07 to $57.22 per acre).

Timber is usually sold in this district either in tracts for a stated sum, or at prices varying with the dimensions of the logs. The logs coming to Riga range from 7 to 9 inches at top; the bulk are 8 and 7 inches, the quantity over 9 inches thick being very small.

Felling the trees and hauling the logs to the railroad or nearest stream is for the most part possible only during the season of snow roads in winter, and is either undertaken by the purchaser, usually a lumber dealer, or the seller agrees to deliver the logs to the contracted spot, whereby it often happens that a mild winter or the absence of snow roads makes it impossible to haul out the logs from the forest and penalties for breach of contract are incurred.

The prices paid for felling and hauling vary according to the price of labor current in the district and the distance to be hauled. An estimate of the cost of bringing to Riga an average log of 28 feet length, diameter at butt end 11 inches, at top 8 inches, from a forest in the Province of Vitepsk lying 10 miles from the river Dvina, gives, per fathom of 7 feet: Felling and hauling, 15 kopecks; making roads in forest, 3 kopecks; tying into rafts, 3 kopecks; rafting to Riga, 15 kopecks; making a total of 36 kopecks, or 18½ cents.

The cost of sawing at the railroad is stated to be $5.15 per standard of 165 cubic feet; cartage at station, $1.03 per standard; average railroad freight to Riga, $5.15 per standard. The total expenses—sawing, lighterage, etc.—insurred at Riga to convert logs which have been rafted down the river into lumber for export would amount to $9.27 per standard. Sawmill charges at Riga are $6.70 per standard.

LARGE SALE OF TIMBER

CHIEF FORESTER GRAVES went to San Francisco in September to make final arrangements under which a California lumber company will purchase 800 million feet of timber on the Sierra National Forest. The timber has already been awarded, after public advertisement, to the highest bidder, but under the terms of the advertisement the final signing of the contract will not take place until the company has been shown on the ground what timber the Government will regood forest conditions and provide for serve from cutting in order to preserve reproduction.

The company will be allowed its full 800 million feet, but naturally it will not be allowed to cut clean. As a rule the Forest Service reserves something like one-third of the forest stand in applying forestry on Government holdings. A marking board made up of one man sent from Washington, one from the District office in San Francisco, and the local Forest Supervisor will carefully mark a sample area, to show how the restrictions on cutting will be applied. Representatives of the company will then go over this area, after which Chief Forester Graves and his assistants will, it is expected, make final arrangements with the company in San Francisco, and the contract of sale will be signed.

"The Forest Service," said Mr. Graves in speaking of this sale, "has received a number of inquiries whether in selling so much timber to a single purchaser the Government may not be opening the way to a monopolistic control of local lumber markets. Other correspondents are disturbed lest the sale prove a bad bargain for the Government through the rise in value of the timber in the twenty-two years during which the company will cut.

"Such large and long-time sales of National Forest timber as that to the California company are a new development in the Forest Service. Great bodies of mature but inaccessible timber can be put on the market only if sale contracts are let on terms which will justify a very heavy initial investment in transportation facilities. In entering into such contracts, however, special safeguards to protect the public against monopoly and to prevent an undue speculative profit to the purchaser are employed.

"The National Forests contain, in all, the equivalent of nearly 600 billion feet of timber now of merchantable size, besides young growth for future harvest. Because of its remoteness from market and the wild, mountainous country, without transportation facilities, in which most of it lies, only a small percentage can now be sold on any terms. Most of it would cost more to get it out than it would bring. The sale of less than one-fifth of one per cent of our total supply to one company leaves plenty of room for competition by other companies.

"The timber which has been sold to the California company lies well back in the Sierra Nevada Mountains and will require the construction of 70 miles of standard-gauge railroad to open up the area. Since this road will also open up other National Forest timber and will be a common carrier, it creates another safeguard against monopoly. The company is given a cutting period of twenty-two years to remove the timber, besides an additional two years for the construction of logging and manufacturing facilities. The sale was publicly advertised for six months in order to give an opportunity for all who wished to compete for the contract to make bids, as is done in all large National Forest sales.

"No business organization would undertake the heavy investment necessary in such cases unless the handling of a large body of timber and a sufficient period in which to remove it under practical logging conditions are assured. The great difficulty in making such

long-term sales is to establish a price which will be fair to both sides. No one can foresee future conditions well enough to know what stumpage will be worth ten, fifteen, or twenty years hence.

"Consequently the terms of sale provide for the readjustment of stumpage prices every five years. The basis for fixing the prices will be, in each case, the prices of manufactured lumber in the markets where the timber is sold during the preceding two years.

"For several years the Forest Service has been selling in the neighborhood of a million dollars' worth of National Forest stumpage per year, but this combined with what is cut for free use is only about one-eighth of what might be cut without reducing the permanent stock of the Forests. The supply will be kept up through growth. By making long-term sales it will be possible greatly to increase the amount available for present needs of the timber consuming public, without endangering future supplies through overcutting. It will always remain true, however, that vastly the greater part of our timber sales will be to small purchasers, who are favored wherever possible. Monopoly is impossible as long as the door is kept open for such purchasers. Out of over 5,600 sales made in the fiscal year 1911, about forty were for over $5,000 worth of timber to a single purchaser."

RESTORING ELK TO THE FORESTS

RESTORATION to the forests of the Rocky mountain region of at least a portion of the great herds of elk which formerly roamed the mountain sides all the way from northern Canada to the Mexican line, is a project which the biological survey of the Department of Agriculture in conjunction with the United States Forest Service has taken up.

Contrary to the accepted belief that the elk of the United States suffered decimation and practical extinction through slaughter by hunters, white and red, the Forest Service explains that starvation occasioned by the consumption of the herbage by the cattle, and, more particularly, by the sheep on the ranges, has been the chief cause of the dying out of the elk.

In Yellowstone Park, however, there have been all along several fine herds of elk; also in the regions of Wyoming surrounding Jackson Hole there is a superb herd.

In the summer of 1911 Supervisor Knowles obtained a shipment of elk for the Sun Dance National Forest. The Wichita Forester, in western Oklahoma, besought the Washington chiefs of the allied services for a small herd. Eight were sent him in 1909, and the Wichita herd now numbers twelve.

It is the present intention of the biological survey to fill out each and every request of the forest supervisors wherever favorable opportunity offers. So long as the slender money supply available lasts these transfers of elk from their present habitat to the newer sections of the distant west will be effected.

The transportation of the elk is an interesting as well as an exciting process. The younger elk, that is, bucks and does, ranging in age from seven to eight months up to two years, are tempted into fixed corrals and trapped. After the trapping they are roped and tied. In the instance of the recent transfer from the Yellowstone region to the Sun Dance forest reserve, the journey was made for a considerable portion of the way by sleds. The animals, in separate frame cages, were laced on the sleds and drawn by sturdy mules mile after mile across the hills and prairies to the railway.

The favored time for moving the elk is in the early spring. By that time the animals born the preceding spring are stout and strong enough to withstand transportation. In the first effort at transplanting elk, twenty-six animals made the journey. Four died from injuries received in the ninety-mile sled haul from Jackson's Hole to St. Anthony, Idaho, where the transshipment to the railway was effected. One female died a few months later from unhealed fractured ribs, evidently suffered on the railway journey. At Sun Dance the other twenty-one elk are now strong and hardy.

The transference of the elk from the more northern latitudes to the less rigorous climates of western Oklahoma, Arizona and New Mexico, it is believed by the biological experts, will result in the rapid propagation of this valuable and desirable game animal. The elk is not subject to disease and after the fourth year the female usually bears twin elk calves annually.

It is the belief of the biological survey that the elk population of the United States will, through the means now taken to develop herds in many sections of the Rocky mountain region, double within the next three years. Within a decade it is the belief of Chief Palmer, of the bureau, that an approximate restoration of the indigenous herds will be brought about.

FIRE LOSSES IN WASHINGTON

THE Washington Forest Fire Association, of which George S. Long is president and J. L. Bridge chief fire warden, have sent out through their secretary, O. Bystrom, a statement to members from which the following are taken:

No damage was done in Washington to timber until about the middle of May, when three very hot days came and fires swept over logged-off areas, doing considerable damage to logging equipments and in some instances to green timber. Heretofore May has been regarded as a safe month, so much so that the State law does not include it in the dry and dangerous season, which begins June 1. There have been no fires on account of the wet summer since May.

Instructions were issued to rangers to keep a lookout for trespassers and report any breach of the law promptly to the office. Several reports of that kind were received, and the owner upon whose land the fire occurred was notified.

The Washington Forest Fire Association, as generally known, is a private one. It is made up of timber owners throughout the State. This year the total assessments were only 1 3-4 cents per acre, somewhat less than former years.

SOME OHIO STATISTICS.

Ohio had 1,390 *factories assigned to the lumber and timber division. The average number of employes was* 13,456. *The value of the products was* $34,597,000. *The greatest number of employes in any one section were those engaged in foundry and machine shops, amounting to* 64,817. *There has been little change in the value of the lumber output in ten years. Sawmilling has declined, but the output of planing mills and boxes has increased. There were* 411 *independent planing mills.*

NEWS AND NOTES.

Careless Campers Caught

Information was filed in United States Court at Seattle the other day by Assistant District Attorney Charles F. Riddell, charging H. W. and Frank H. Herkenroth, Thomas McLaughlin and Arden Purvis with having set a fire in the Government forest reserve in Clallam county and of having left without extinguishing it.

The defendants claim that the fire was set for cooking their breakfast while camping, and that they had taken care to extinguish it. Some live coals remained, and the forest ranger found it a few hours later.

Prosecution was directed from the department at Washington on the grounds that there have been a number of similar infractions of the law and that the effort should be made to put a stop to it. The defendants were released on their own recognizance.

Black Beetle Invasion

An invasion of black beetles that threatens to wipe out the hickory trees of Long Island is described by J. J. Levison, of the Brooklyn Department of Parks, and a vigorous campaign against the destructive bug is urged. The new pest, according to Mr. Levison, may, unless promptly checked, prove as deadly to trees as the chestnut tree fungus has already proved.

The black beetle bores into the bark of hickory trees and in a very short time effects their death. The insects multiply very rapidly, and are very industrious in their short but dangerous lives. Already, according to Mr. Levison, the ravages wrought by the pest are plainly to be seen in the hickory trees aling the north shore of Long Island.

Wilson in the Forests

Secretary of Agriculture Wilson left Washington a few weeks ago for his home in Iowa. After a short rest he then made a tour of some of the national forests with Chief Forester Graves to make a general study of the problem of agricultural lands within the boundaries of the forest reserves.

The agricultural appropriation bill provided that the Secretary should make a report segregating the lands which might be valuable for agriculture alone from those which would be more valuable for other purposes.

New York Selling Trees

The Conservation Commission of New York State has 5,136,650 trees ready for distribution to the public in lots of 500 or more. They may be obtained at little cost by any person interested in reforestration. The orders will be filled as received while the supply holds out. The trees must be used only for planting on lands within the State, and it is a violation of law to sell them or give them away directly or indirectly.

Heretofore the Conservation Commission has distributed trees only in the spring, but will commence distribution for fall planting this year. No order will be filled for less than 500 trees, and an extra charge of $1 will be made for any order less than 1,000 trees. No order for more than 50,000 trees of any one species will be filled if the supply of that species is limited. The orders will be shipped from the nearest nursery, the applicant to pay express charges. The State will furnish the trees at the following prices, f. o. b.:

White pine transplants, four years old, $4 a thousand; three years old, $3.50, and seedlings, two years old, $1.50. Scotch pine transplants, four years old, $4.50 a thousand trees; three years old, $3.50, and two years, $1.50. Austrian pine, three years old, $3.50 a thousand; Norway spruce, three years old, $4 a thousand; basswood, $3 a thousand; white ash seedlings, $3; tulip poplars, $2.50; black locust, $2.50; Carolina poplar, $1.50, and basket willow cuttings, $1.50 a thousand trees.

Plant Pests Barred

Secretary of Agriculture Wilson has announced his intention, under the new federal quarantine law, to declare a quarantine against Hawaii for the Mediterranean fruit fly and prohibit the importation of four species of pine from Great Britain, France, Belgium, Holland, Denmark, Norway, Sweden, Russia, Germany, Austria, Switzerland and Italy to prevent the importation of white pine blister rust.

The importation of potatoes that may bring the wart disease from Newfoundland, St. Pierre, Miquelon, England, Scotland, Ireland, Germany and Austria-Hungary will also be prohibited, according to present plans.

Before issuing proclamations the Secretary gave public hearings to persons interested, and will receive arguments in writing.

He set September 16 for the white pine blister rust hearing, September 19 for the fruit fly hearing, and September 20 for the potato wart disease hearing.

A Moving Forest in Wales

A strange story of a moving wood near Llandaff was told at a meeting of the district council by one of the members (Mr. William Hopkins), says the *London Chronicle*.

The wood, he said, was situated on a steep slope and was gradually moving toward the road at the foot. The wood is quite 400 yards long, and consists of stately elm trees. It had "left its moorings," he said, and was moving bodily toward the Llanvithyn road. A cut had been left at the top, which was full of water.

Some of the trees were coming down bodily, while others were leaning in all directions. The wood had been moving now eight or nine days, and it was some little distance from the road, but was in danger of coming on to it.

Studying Lumbering Industry

E. P. Secker, the special agent of the Commerce and Labor Department who is investigating the lumber trade abroad, may make a trip around the world, touching at all important countries, in pursuit of his duty. Mr. Secker is now in England. He has been abroad since spring. He is expected at present to study lumber trade conditions throughout Europe, see what the market there demands in the way of lumber, etc., and find openings for the American lumber exporter. If his work comes up to the hopes of the Department and of the trade, Mr. Secker is expected to be ordered to extend his work beyond Europe into other continents and the islands of the sea. In that event he will be absent from this country for a year or more longer.

Forest Reserve Transfer

The Forest Service has begun the work of closing up the purchases of land made under the provisions of the Weeks law for the formation of the Appalachian forest reserve. The first deed to be filed was at Marion, N. C., for 8,113 acres. The Government has options on about 16,000 acres immediately adjoining this property. Although the Weeks law became effective March 1, 1911, so much preliminary work was required that the actual transfers are only now beginning.

Wood Distillation

The United States Forest Service has recently issued an interesting bulletin on the distillation of resinous wood by saturated steam. The bulletin was prepared by L. F. Hawley, chemist in forest products, and R. C. Palmer, assistant chemical engineer in forest products, and describes a series of experiments along this line carried on at the forest products laboratory.

The experiments were undertaken by the Forest Service because there has been no uniformity in the commercial distillation of pine, and no definite ideas among operators as to the proper steam pressure, size of chips or rapidity of distillation, and little or no data has been heretofore published regarding the differing results from changes in these readily controlled variables.

Lightning Hits All Trees

The Department of Agriculture has made public the results of an exhaustive investigation of lightning strokes throughout the country. The report disposes of the belief of the ancient philosophers that certain kinds of trees—the laurel, aspen and beech—were never struck by lightning with the statement that "any kind of tree is likely to be struck."

The report shows that lightning strikes in the Colorado plateau region more often than anywhere else in the country, and asserts that lightning is a prolific source of fires in the forests of the West.

ILLINOIS LUMBER PLANTS.

In Illinois there were 814 *plants at work in lumber and timber, employing an average of* 16,567 *people. The output was valued at* $44,952,000. *The number of men employed in foundry and machine shops were* 52,266; *the next largest number being in manufacturing men's clothing and shirts, to-wit,* 36,152. *The great value added to forest products in that State came from planing mills and other woodworking plants, even though over one-half of the establishments were sawmills. The increase in the value of lumber products reported in the State has been very great in the former five years.*

STATE NEWS

New Jersey

Much valuable information concerning the planting and care of shade trees and the prevention of diseases which are fatal to them is contained in a handsome volume just issued by the Forest Park Reservation Commisison of New Jersey and entitled the "Planting and Care of Shade Trees." The book contains 128 pages, is handsomely illustrated, several of the illustrations being fine colored plates of injurious tree insects; and several charts which graphically depict methods of caring for diseased trees, that they may be made healthy again. The illustrations in the volume are well chosen to give instructions as to how trees should be planted to give the best effect, particularly in cities.

The volume is for general distribution among people who are interested in shade tree culture and in the prevention or the cure of diseases in shade trees, and a copy may be obtained by addressing Alfred Gaskill, State Forester, at the State House at Trenton. The book is made up of an article on "The Planting and Care of Shade Trees," by the late Dr. John B. Smith, State entomologist, who died March 12, 1912, and another paper on "Diseases of Shade and Forest Trees," by Mel. T. Cook, State plant pathologist. The cost of issuing the book was borne by Charles LaThrop Pack, of Lakewood, a member of the Forest Park Reservation Commission.

Texas.

I. M. Johnson, of Houston, until recently special agent of the State Department of Agriculture, was in Dallas recently and perfected arrangements for tackling the diseased trees of Dallas.

It is the intention of Mr. Johnson to spend a week out of each month in Dallas, giving his personal attention in overseeing the work, which will be under the supervision of a graduate of the School of Forestry, University of Michigan, who also has had three years' experience in the Forestry Service, Department of Agriculture, Washington, D. C. This party, Z. T. Bliss, at present is superintendent of the tree work in Houston which is being done by Mr. Johnson.

Massachusetts.

The report of the State Forester's office that losses this year in Massachusetts amounted to only $50,000 up to August 1 is gratifying to those who are responsible for the establishment of observation stations on high points throughout the State. Seventeen of these lookouts are now maintained, and the justification of the system is the fact that this year's losses are about $500,000 less than the losses during a corresponding period last year.

There is still a long period of the fall season when forest fires will be a menace. But it seems likely that this year may establish a new low record of losses.

New York

An agreement has been made between the State Conservation Commission and the Adirondack League to experiment in forestry on the 140,000 acres of forest lands owned by the league at Little Moose, Herkimer county, according to Governor Dix. It is proposed to permit the lumbering of the league's tract by cutting matured trees and planting at least one tree for every tree taken.

The Governor, who recently addressed the league in favor of this plan, said that systematic lumbering would in no way injure the forests or interfere with wild game.

The league is composed of wealthy citizens, who, heretofore, have always opposed the extensive cutting of lumber in the Adirondack forests.

Minnesota

The need of a city tree warden in St. Paul is acute, according to State Forester Cox, who declared recently that he approved highly the move of the Women's Civic League toward getting such an official for this city. The number of complaints and questions that come to the office of the State Forester from women and householders, who ask for advice as to how to care for their trees, and which his office is unable to care for, indicates that the appointment of a city forester would answer a crying need, Mr. Cox said.

Wisconsin

By a purchase consummated a few days ago the State of Wisconsin added 20,000 acres of land to its forest reserve, the timber tract acquired being located in Oneida and Vilas counties. It was bought from the

Land, Log and Lumber Company, of Milwaukee. The State has been negotiating for these lands for over a year. They were cut over about twenty years ago, and the area comprises nearly two townships. Another large deal will be made soon, when the H. W. Wright Lumber Company, of Merrill, will transfer 16,000 acres of cutover land to the State. In addition to these two large purchases, the State forest reserve has been increased by the acquirement of 500 acres comprising 250 small islands donated by Congress and located in inland waters in the northern part of the State, giving the State a complete forest reserve of about 400,000 acres, not including the lands held by the State for sale to be used for agricultural purposes.

Louisiana.

Reports from the overflow section of Louisiana and Mississippi indicate much damage to logs and down timber by a black beetle that has flourished unusually well since the overflow set in. The beetle is a borer which goes through the wood as if it was dust.

A number of lumber companies operating in overflowed sections have called off their men in the woods until all logs on hand have been put through the mills. Several concerns, especially in Northeast Louisiana, report that the beetle has caused them thousands of dollars of damage. The damage is greater in some sections than others, seemingly depending upon present ground conditions.

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JAPS SUPPLY THE CHINESE.

The lumber for packing cases, etc., used by the Chinese comes chiefly from the Yalu River region, and the trade in this lumber is entirely in Japanese hands. The importation is in the form of squared logs, which are purchased by Chinese carpenters and sawed up into boards by hand. Attempts have been made to introduce sawmills for this work, but the price of labor is so low here that it is cheaper to cut boards by hand than by steam.

MASSACHUSETTS' SHOWING.

In the State of Massachusetts, under the head of lumber and timber produce, 708 *establishments are listed, employing on an average of* 8,967. *The value of the output was* $23,026,000. *Lumbering in that State is a very insignificant factor when compared with the manufacture of cotton goods, which employs* 108,914 *people. The boot and shoe makers employ* 83,063. *The value of the output of the latter exceeds that of any other line of manufacture. In Massachusetts the number of independent planing mills was* 208, *with* 391 *sawmills and* 109 *packing box factories. There were cut in that State* 361,200,000 *feet of*